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LAKE CARRIERS' ASSOCIATION.

To consider and take action upon all general questions relating to the navigation and carrying business of the Great Lakes, maintain necessary shipping offices and in general to protect the common interests of Lake Carriers, and improve the character of the service rendered to the public.

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STEAMBOAT INSPECTION.

Last summer much discussion was caused in lake marine circles by a demand for a change in the inspection of lake vessels for the better protection of the lives of the passengers and crew in the case of accident or disaster.

Particular stress was laid upon the poor provisions made to render the life-boat service on passenger boats effective, and Supervising Inspector-General James A. Dumont, at the head of the Vessel-Inspecting Department at Washington, gave the matter his attention. He was interested more directly in the case of a woman who jumped overboard from a steamer plying between Port Huron and Detroit, and was drowned, mainly on account of ineffective life-boat service. It was said that the woman might have been saved had the ship's life-boat been in condition to render speedy help, and Inspector-General Dumont gave out that he would investigate the matter and place the blame where it belonged.

So far as it is known at present the ships on the Great Lakes will ply this summer under the same restrictions governing life-boats and other life-saving appliances as existed in 1899, and which resulted in the display of ineffectiveness that marked the attempt to rescue the woman on the Detroit-Port Huron run.

Now comes a call from the Atlantic coast for a change in the steamboat inspection service, and it will interest marine men if only for the fact that it confirms the revelations made last year in connection with steamboat inspecting on the chain of lakes.

In a recent letter to the American Shipbuilder, of New York, James Richardson scores the Steamboat Inspection Service for the loss of life that has occurred lately on several wooden barges along the Atlantic coast. He says that the loss was due mainly to the lack of proper life-boats or other life-saving appliances on these vessels. Mr. Richardson writes in part as follows:

"There are many instances where lives were lost on wooden barges that might have been saved if suitable life-saving appliances were to be had. The style of davit for launching ships' boats is not mentioned in the statutes, nor in the regulations governing the equipment of steam vessels. Whether this is a matter that is left to the discretion of the board of supervising inspectors of steam vessels I know not. If it is, it is certain that sufficient care has not been given to the subject, which is a most important one, and can not be remedied any too soon.

"When statute 4488 was enacted the best detaching apparatus known at that time is ascribed and embodied in the statute as follows: 'Shall have the life boats required by law provided with suitable boat disengaging apparatus so arranged as to allow such boats to be safely launched while such vessels are under speed or otherwise, and so as to allow such disengaging apparatus to be operated by one person, disengaging both ends of the boat simultaneously from the tackles by which it may be lowered to the water.' Since the enactment of this law other devices better adapted and more reliable have been invented. The board of supervising inspectors claim the wording of the statute prohibits them from adopting any other good device, no matter whether it is better or not, and that they can not approve or enforce the use of any other. If this is the case, which is doubtful, the quicker statute 4488 is amended the better it will be for the public who travel by water. Repeal this worthless feature of the statute and the heart-rending accounts caused by the inability to lower and detach the boats in time of diaster will be of less frequent occurrence.

"If the laws govering these matters are such as do not admit of enforcement, then change them so that they may be enforced, and if those whose duty it is to enforce the laws fail to suggest and seek necessary changes they should be censured and held accountable to the proper authority. If they are incompetent in this regard competent men should be appointed. They should be men who by practical experience are able to determine what is best and then act without fear or favor. They should be up to date men, familiar with all appliances for modern steamers and independent of all political influences."

THE SUBMARINE BOAT PURCHASED.

An arrangement has been effected between the Navy Department and the Holland Submarine Torpedo Boat Co., by which the government will come into possession of the Hollandand secure compensation for the construction of the Plunger if that vessel is not completed in accordance with the contract. The department has agreed to purchase the Holland for $150,000.

THE WEATHER BUREAU AND COMMERE ON THE GREAT LAKES.

In the December report of the Michigan section, Mr. C. F. Schneider, Section Director, gives a number of items relative to the navigation of the Great Lakes during 1898 and 1899, from which we take the following:

Number of vessels, 20,255; number of passages during the season, through the Detroit river, either way, 22,741; number of passengers, 49,082; bushels of wheat, 58,397,355; barrels of flour, 7,114,147; tons of iron ore, 15,328,240; feet of lumber, board measure, 1,038,077,000. There are about as many clearances of vessels at lake ports as there are from all the seaports of the United States combined.

The Weather Bureau furnished the masses of vessels passing Detroit 16,200 weather maps and 22,500 weather forcasts, storm warnings and special afternoon reports of the wind. No vessel of importance passes Detroit without getting its weather map and forcasts.

The astonishing importance of the commerce of the Great Lakes depends partly upon the fact that so many vessels leave the lake ports directly for Europe and Asia. During the nine months of the year when the Sault Ste. Marie ship canal is open to nagiation two and a half times as much tonnage passes through it as passes the Suez canal during the entire twelve months. The registered tonnage passing Detroit river during the nine months is more than that of New York, London, and Liverpool combined. The fact that the merchandise is largely wheat, flour, iron, and lumber, instead of silks and teas and manufactures of all kinds, does not in the least diminish its importance or the responsibility of the Weather Bureau in regard to this commerce.—Monthly Weather Bureau.

THE POSSIBILITIES OF SUBMARINE NAVIGATION.

"Few of the inventions which have helped to make the nineteenth century memorable," says Fielden's Magazine, in discussing the current trials in the United States and France of submarine craft, "have escaped ridicule and hostile criticism." In reference to this it is pointed out that the non-success with which the experiments made with the Narval, the Gymnote, Gustave Zede, and other submarine boats are reported to have been attended, have not exercised any deterring effect either upon the French or American naval experts. "As the position stands," remarks our contemporary, "it is perfectly clear that other nations are taking active measures for the provision of submarine torpedo boats, which, although faulty, might be capable of inflicting serious damage to an opponent in case of war. Very likely their employment would involve serious risk to the crews they contain, but then, risks of this kind are always cheerfully undertaken by men whose duty it is to fight. Some day our costly battleships may be exposed to attack from hidden foes, and our responsible officials will then make the customary prodigious efforts to place the national armaments on a footing equal with that of our opponents. Constant innovations are, no doubt, calculated to upset the happy tranquility of any comfortable government department. If it must be upset, then let it be. The British nation cannot always be listening to the same refrain 'too late!'"

LIFE SAVING DEVICES.

"More than a hundred models and plans of a workable life-saving device in case of a disaster at sea," notes the Boston Globe, "have been submitted by Americans in competition for the Pollock prize of $20,000, which is to be awarded during the Paris Exposition. Some of these devices, the work of naval experts, are said to be exceedingly clever, including a superior kind of life buoy; a water-tight bulkhead, which may be closed by means of electricity at a distance; a life-boat that can be swung clear of a ship and easily detached from it, and an eophone sound detector that enables signals or warnings to be heard clearly a great distance, even in the foggiest of weather. Reward and fame never can be merited more fully than by the man who succeeds in diminishing 'the perils of the great deep.'"

NEW SURVEY FOR THE CHICAGO CANAL.

The House Committee on Rivers and Harbors has agreed to report favorably on Congressman Lorimer's resolution providing for a new survey for the proposed deep waterway from Chicago to the Mississippi river. The resolution asks for authority to make a survey of the Des Plaines and Illinois rivers for a channel from 10 to 14 ft. in depth. The survey recently completed was for a channel 8 ft. deep. The amount remaining of the $30,000 appropriated for the orginal survey will be utilized for begining the new survey but no further appropriation will be recommended at present.

ONE HARBOR'S GOOD WORK.

Editor of The Nautical Gazette.

Dear Sir: Duluth Harbor No. 44 would like you to notify the public that it was through our efforts that the appropriation for hydrographic purposes was increased from a mere $35,000 to proportions more adequate to the importance of the work. Also that we were of the first to have the new code of signals between pilot and engineer changed so as to include a "checking signal," which was omitted by the Supervising Inspector's board.

Yours truly,
C. D. HIBBARD, Captain's Clerk.

Duluth, April 5.

DULUTH—SUPERIOR.

Special Correspondence to The Marine Record.

Capt. Maytham has purchased the tug Thomas Wilson from the George Hall Co., Ogdensburg, N. Y., and she will be brought here this week.

During the first five years that Capt. Inman was engaged in the tug business at Duluth he went "below" every spring to bring a tug up to the head of the lakes. He says that for those five years he was the first to bring a boat through the Sault river.

The impression seems to prevail among Duluth vesselmen that navigation will open about the 25th instant. The ice in the lake opposite Duluth is not wasting very rapidly at present, owing to the fact that it is held firmly in place by a cold northeast wind. A warm rain would no doubt hasten the disappearance of the ice.

Charles Stone, of St. Paul, was the lowest bidder at the reopening of bids for placing the footing blocks of the north pier of the Duluth ship canal and constructing the monolithic superstructure. His bid was $41,796.40. The Butler-Ryan Co. bid $44,508 and P. McDonnell, of Duluth, bid $41,974. The Butler-Ryan Co. was the lowest bidder at the original opening of proposals. Their bid on that occasion was $47,569.12.

The Inland Ocean, published at West Superior has changed hands, Scott & Ward having disposed of the paper to Messers Chandler & Dunn. The Inland Ocean under the old management established an enviable reputation in the newspaper circles of the Northwest and the new management will maintain the same reputation. From their salutatory we may expect even a better journal than was published formerly.

A fire broke out in the blacksmith shop and furnace room of the shipyards last week. The large building, 80 x 200 feet and one story high, was completely destroyed. The loss on the building, stock and machinery is estimated at about $20,000, mostly covered by insurance. The company will rebuild at once. The fire will not greatly cripple the general work of the company. Damage to the bending table is most the serious, and there will be some delay in completing the barge now under construction.

Folders have been issued by the White Line Transportation Co., which will run the steamer Bon Ami on the Isle Royal route this year, sending her out of Duluth every Monday for Hancock and Houghton and every Friday for Grand Marais on the north shore. The round trip fare between Houghton and Duluth will be $8 first class and $3 second. Return tickets between the two points will be good on all the steamers of the L. M. & L. S. T. Co., with which connections will be made at both Duluth and Hancock. The new line will furnish a direct and easy method of reaching Isle Royal for camping and fishing parties, the island having heretofore been accessible only to private parties, who could go to the expense of chartering a tug to take them over and will undoubtedly attract large numbers of tourists and sportsmen to that largest and most beautiful island on all Lake Superior. W. H. Singer, the new vice president of the L. M. & L. S. T. Co., is the general manager of the transportation company while Capt. Flynn will again command the Bon Ami, which has splendid cabin accommodations.

BUFFALO.

Special Correspondence to The Marine Record.

Erie canal is to be opened April 25th.

Steamers W. H. Stevens and Avon have been moved to Tonawanda.

Gov. Roosevelt has signed Senator Davis' bill, which permits use of a balance of $12,635 of a former appropriation to deepen the Erie Basin at this port.

Six steamers and twelve barges will be at Toledo to load grain for Canadian ports as soon as the Welland canal opens. They will have a capacity of 840,000 bushels of corn.

The charter rate on anthracite coal out of Buffalo has been fixed at the following figures for first cargoes: Duluth, 50 cents; Portage, 60 cents; Chicago, 75 cents; Milwaukee, Manitowoc, Sheboygan and Green Bay ports, 70 cents; Waukegan, Kenosha and Racine, 80 cents.

The Pittsburg Coal Co. has fixed the price of Pittsburg coal for steamboat fuel at Ohio ports and Erie at $2.75 a ton and $3 at Buffalo. The price at Detroit and St. Clair river ports is $3; $3.50 in the "Soo" River and $3.75 at Chicago. Hocking Valley coal prices are as follows: At Toledo for shipment north and west, $1.85 on board; fuel coal for boat, $2.35 at Ohio ports, $2.75 at Detroit, $3.25 at the "Soo," and $3.50 at Chicago.

CHICAGO.

Special Correspondence to The Marine Record.

The steamer Onoko, light, arrived here Sunday afternoon from Milwaukee to load grain.

Higgie & Chamberlain chartered the schooner Grace G. Gribbe for corn to Depot Harbor, Canada, at 2 cents.

The steel steamer Senator finished loading a cargo of oats consisting of 328,000 bushels, at South Chicago, on Tuesday.

The steamers Uganda and Nicaragua and barge Paisley, light, arrived at South Chicago from Milwaukee on Friday, to load grain.

I have to thank Mr. C. F. Cauright, agent for the Goodrich Transportation Co., for courtesies extended to the RECORD this week.

The steel steamer Jesse Spalding left here early Tuesday morning for Detroit with corn, the first of the grain carrying fleet to get away this season.

The steamer Gordon Campbell received a new smoke stack at the Youghiogheny & Lehigh Coal Co.'s dock Tuesday, and left for Sarnia with 95,000 bushels of oats.

The passenger steamer I. M. Weston arrived from Montague, Mich., Sunday morning. She will be used in the excursion business on the drainage canal this summer.

John Muzzey, an old marine engineer, died at Milwaukee Sunday. He was a resident of Manistee and was formerly for several years engineer with the Canfield tug line. He will be buried at Manistee.

A number of the grain laden fleet here will leave for the Straits tonight. The steamer Hendrick Holden arrived here this morning from Milwaukee, and will load wheat at the Northern Grain Co. elevator B.

The schooner Grace G. Gribbe, Capt. Wm. Kaupman, and schooner Geo. L. Wrenn, Capt. Shomer, arrived here Sunday noon from Ludington with lumber, the first schooner to arrive with lumber this season.

Capt. Jimmie Ferguson is with Tom Sullivan, the well-known vessel supply man again this season. No man on the lakes is better known, more respected, or a better hustler for marine trade than Capt. Ferguson.

The steamer Gogebic and barges Biwabik and S. H. Foster grain laden, are ready to start for Port Huron, and the steamers Ira H. Owen, Parks Foster, Chas. Stewart Parnell, Wm. B. Morley and several others are ready to start for Buffalo, a large fleet will leave during the present week.

Lumber freights from Manistee to Chicago have opened up this season at $1.50 per thousand feet, which is higher than at the opening a year ago, althought it is not any too high, when the price of coal for fueling purposes, which has been raised $1.10 per ton here is taken into consideration.

The Gordon Campbell followed the Spalding bound for the lower lakes on Tuesday, and now they are all breaking away. No less than ten steamers will clear and sail from this port on Wednesday, and then it will be, as always, a case of follow the leader. I counted today fifty-nine boats having taken out their clearance papers.

Charley Gulbranson, for many years with the late Richard Chester, of fog horn fame, and until recently with Wm. Ingram & Co., marine lamp manufacturers and general marine workers, is now connected with Johnson & Co.'s brass and iron works, at 213 East Randolph street, and is making a specialty of all kinds of marine work in his line of business.

The steamer Edward Buckley, Capt. Chas. Greenwich, arrived here the first time this season on Saturday morning with salt from Manistee, and on Tuesday with lumber from the same port. She had made one trip to South Chicago with salt before coming here on Saturday. The Buckley is well kept up and looks as good as new. She has loads ahead which will keep her busy all the season.

The steamer George G. Hadley was in drydock for bottom searching. She has undergone extensive repairs during the winter months under the superintendence of Capt. M. Fitzgerald. The iron side-wheel steamer Ivanhoe was put in dock and torn up for scrap iron. The schooner James G. Blaine had her mainmast, fore and mizen topmasts and jibboom taken out and has been converted into a barge, to be towed with the Annie M. Peterson, by the steamer Neko. Capt. Arnold Green will be master of the Blaine.

At a meeting of the Board of Aldermen, of this city, held on Monday last, the Mayor recommended economy in expenditures for every purpose except the dredging of our river; the Board of Public Works were instructed to advertise immediately, for bids for dredging, to the upper end of the Wisconsin coal dock, to a depth of 20 feet; the City Engineer was instructed to ascertain the amount of dredging required to make a 14-foot channel to the Wisconsin Central swing bridge, and which it is proposed to do this summer; this will give almost a mile more of dock frontage availiable for boats to lie at next winter.

The Licensed Tug Men's Protective Association of the Great Lakes No. 2, of Chicago, have adopted a scale of wages for captains and engineers at this port and South Chicago, and have sent a copy of their resolution to the towing companies and dredging companies. The captains of the Vessel Towing Company's tugs ask for $150 per month of 30 days and board, the same wages as they received last year. The engineers ask for a raise of $10 per month, from $95 to $105 and board. The deck hands and firemen also ask for a raise of $10 per month, from $50 to $60 and board. There is also a stipulation in the resolution as to hours. The men require two nights off in nine days and two nights off with every blow-off. The wages asked for from the dredging companies for their largest tugs is $135 per month and board for captains, $95 per month and board for engineers, and for their smaller tugs $125 per month and board for captains, and $90 per month and board for engineers. Where no cooks are carried, captains and engineers to be allowed $15 each for board each month. Owners and managers to hire captains and engineers; captains to hire cooks and deck hands, and engineers to hire firemen.

Capt. Richard A. Davis died of heart failure Saturday morning, at his home, 430 Irving avenue, Chicago. He was born on Woolf Island, Canada, on November 23rd, 1829, and came to Chicago from Oswego, N. Y., in 1872. He was one of the oldest captains on the lakes and had master's papers dating back for 40 years. The first vessel he was master of was the schooner Seminole. He has for many years been engaged in the steamboat excursion business on the lake front. He commenced with the small steamer Barney, and afterward built and ran the steamer Josie Davidson, which he disposed of and then purchased the steamer Lena Knobloch, which he owned at the time of his decease. No man was better known or more highly esteemed than Uncle Dick Davis, as he was familiarly called by his many friends and patrons. He was married in 1852 to Miss Susan Sinclair, who survives him, he also leaves one son, James Henry Davis, living in Woodlawn, and one daughter, Mrs. Margaret McGregor, wife of Capt. Frank McGregor, of Chicago. He was a member of Piolades Lodge, A. F. and A. M., and Chicago Harbor lodge of the Masters' and Pilots' Association. The funeral took place at Rose Hill cemetery, Tuesday afternoon, and was conducted by the Masons and the Masters and Pilots' Association. There was a large attendance of marine men and other friends of the deceased.

DETROIT.

Special Correspondence to The Marine Record.

Navigation is now open from here to Lake Erie ports and cargo steamers are leaving since Tuesday.

The steamer Sawyer and barges cleared for Cleveland. They are the first departures of the winter fleet. The river is now clear of ice.

The tug D. N. Runnels was brought here from Marine City on Wednesday to be turned over to Maytham & Co., of Buffalo, who recently bought her for $7,000 from J. C. Miller, of Marine City. The tug will be used in opposition to the trust.

The Nipigon Transit Co. has been organized to purchase and operate the steamer J. C. Ford and other steamers. The capital of the company is $50,000, of which 80 per cent. is paid in. Paul Weidner and Alfred K. Kiefer, of Detroit, and Otto L. E. Weber, of Port Huron, hold one share each, and Kiefer holds 797 as trustees. The home office of the company is at Grosse Pointe.

There will be a considerable development of the marine postoffice service this year, in that money orders and registered letters can be sent directly from the deck of the passenger steamer. The system is said to be so simple that practically all the sailor has to do, who wants to send money to his family, is to lower it to the mail boat over the side of the steamer, and Uncle Sam will do the rest. The marine postoffice will open for business as soon as the first freight steamer heaves in sight passing Detroit.

The Pere Marquette Railroad Co. have bought 2,000 feet of dockage at Toledo and will commence immediately the construction of a suitable wharf for the transfer of coal and miscellaneous freight from cars to vessels and vice versa. With the excellent car ferries operated by this system from Muskegon and Ludington to Milwaukee and Manatowoc, the new docks at Toledo will enable them to control a large part of the lake coal trade for the west and northwest from the Hocking Valley and other Ohio fields.

The steamer Jesse Spalding with grain from Chicago and the passenger steamer State of Michigan from this port for Chicago share the distinction of the first passage through the Straits this year. The State of Michigan reached Mackinac on Wednesday, and the Spalding continued on her way, so to her is due the credit of the first finished trip through the Straits in 1900. The captains of both boats report no trouble with the ice. The master of the Michigan says he went through a heavy field of ice extending from Ft. Gratiot to Harbor Beach.

Last week there was sold at Fairport at public auction the hull of the burned freight boat Goderich, which was formerly owned by the Hannas. It brought out a number of bidders, and was bid in at $1,200 by the Michigan & Ontario Navigation Co., which is considered a liberal price by vessel men. There is great demand for tonnage by the coal and ore shippers and dealers, and any kind of an old tub that will float and carry a load is in demand. Activity is such in the lake trade that several new boat building companies have been organized since April 1st.

The Michigan & Ontario Navigation Co. has been incorporated in Ontario and has leased the coal and ore barges formerly owned by the Miller Brothers, of Escanaba and Sault Ste. Marie, which they will place in the coal trade between Toledo and Duluth, and on the south-bound trips will load with ore from Escanaba for Fairport. They are also negotiating with Canadian shipbuilders for the immediate construction of two large grain floats, which they will put in the Chicago and Montreal grain trade when completed. This line will be operated and managed in harmony with the Carnegie interests. Mr. B. F. Miller, of Chicago, has been appointed agent of the new company at Duluth, and Mr. L. S. Stewart, recently of the C. & O. R. R., has been appointed contracting agent at Detroit.

CLEVELAND.

Special Correspondence to the Marine Record.

Associated Technical Clubs, The Civil Engineers' Club of Cleveland, Electric Club of Cleveland, Cleveland Architectural Club, Cleveland Chemical Society, 689 the Arcade, Phone Main 1807. Announcement: All members of the several clubs are urged to attend not only the meetings of their own club, but the meetings of the Associated Clubs as well. By doing so, both views and acquaintanceships will be broadened. Further, a speaker generally feels that his efforts are appreciated if he is greeted by a large audience. Saturday night—Club night—whist, pedro, chess and checker clubs can advantageously be arranged for this night.

There is one vessel owner that we certainly do and will miss at this port. Capt. Thomas Wilson has "crossed the river," as stated in a previous issue of the RECORD, but, his body coming home this week has brought back to us the loss of one of the best men in Cleveland. Capt. Thos. Wilson was a savior in disguise. At the funeral on Wednesday there were twelve honorary and twelve active pall-bearers. Honorary—W. C. Farrington, of Buffalo; William Chisholm, Sr., Capt. Alexander McDougall, of Duluth; J. W. Westcott, of Detroit; Capt. William Forbes, of Port Huron; Justin Snow, Horace Ford, Capt. George P. McKay, Capt. J. C. Keath, of Chicago; W. D. Rees, Charles Beatty, of Buffalo, and E. W. Oglebay. Active—Hon. John H. Farley, George L. Quayle, J. E. Upson, Col. J. J. Sullivan, H. D. Goulder, H. A. Hawgood, B. L. Pennington, T. Spencer Knight, J. W. Moore, H. Clark Ford, H. P. McIntosh, and Capt. Ed. Morton.

The following memorial on the death of Capt. Thomas Wilson, prepared this week by a committee consisting of B. L. Pennington, J. M. Curtis and L. H. Winch, was adopted by the Permanent Savings & Loan Co.: "In the sudden demise of Capt. Thomas Wilson the members of this directorate have lost a true friend and genial associate. The breadth of his capacity is evidenced by the general sorrow occasioned by his death, for his loss is realized in every field of human activity, whether in banking, maritime, commercial, social, religious or domestic. As a friend, he was steadfast. As an associate, courteous. As a companion, cheerful. As a neighbor, kind. As a citizen, loyal and patriotic. As a Christian, consistent. In benevolence he was sympathetic, his helpful hand being ever extended in response to the appeals of charity. He has been a stockholder and a director of this company since its organization. We, the members of the directorate here assembled, desire to bear testimony, not only to our personal loss but the loss to this institution, of our associate and friend, whose counsels were ever wise and helpful. And we adopt this memorial tendering our sincere sympathy to the afflicted family in their great bereavement, and direct that it be spread on the records of the company and that an engrossed copy be sent to the afflicted family."

FLOTSAM, JETSAM AND LAGAN.

The iron steamer Onoko went from Milwaukee to Chicago Sunday last.

Commander P. Garst has been ordered to command the Michigan on the Great Lakes. The Michigan will be used as a training ship for the naval militia of the lake states.

Harbor No. 41 of the Masters' and Pilots' Association, Buffalo, will send a petition to Secretary of the Treasury Gage asking that a life-saving medal be awarded to Capt. John Farrell, of Buffalo.

The improvement of the outer harbor at Sandusky commenced this week and the dredge will remain at work until the money at present in the fund is used up. The contractor has received instructions from Engineer Smith to lose no time in rushing the improvement.

The owners of the steamer Algomah were paid $3,000 for the services of the craft in attempting to maintain a channel across Green Bay during January, February and March. The Ann Arbor people had to pay the running expenses and make good all the damage sustained.

The disabled Ann Arbor car ferry No. 1, which lay in the ice near Green Island, Green Bay, has been taken to Frankfort. After considerable repair work has been done on her she will be taken to Milwaukee and put in the dock for a general overhauling and to have her shafts put in.

Capt. A. B. Davis, of the United States revenue cutter Morrill, on patrol duty at the "Soo," has received notice that Lieut. Brockway will be one of the lieutenants on the revenue cutter this year. He has been on duty with the cutter Dexter, at Portland. The Morrill is now being fitted out at Milwaukee.

Eight feet will have to be cut from the Taylor street abutment at Chicago before the steamer Amazonas will be able to pass the Wisconsin Central bridge at Twelfth street. It was thought that the draw would permit vessels forty-four feet in width to pass, but a careful measurement disclosed the fact that the draw is only forty-two feet wide.

NOTICE TO MARINERS.

I find that the Light-House Department has this year changed the numbers of the buoys in Toledo Harbor.

Correct the circular giving time limits as follows:

Make "Black Spar No. 21" in two places "Black Spar No. 23."

Make "Inner Red Can No. 30" "Inner Red Can No. 34."

STEAMBOAT OFFICERS APPOINTED FOR THE SEASON OF 1900.

THE LAKE ONTARIO NAV. CO. Picton, Ont.—Str. Alexandria, Capt. E. B. Smith, Eng. Chas. McWilliams. Water Lily, Capt. Minard Hicks; Eng. G. Gerow. Aberdeen, Capt. Michael Heffernan; Eng. F. Theriault.

SOPER LUMBER CO., Chicago.—Str. James H. Prentice, Capt. Robert T. Evans; Eng. Frank R. Winkel. Albert Soper, Capt. James Hogan; Eng. Frank Costello. Schr. Middlesex, Capt. Paul Weimer; Halstead, Capt. John Lundberg.

JOHN PRINDIVILLE, Mgr., Chicago.—Str. Jesse Spalding, Capt. James Travis; Eng. Fred Otto. Charles Hebard, Capt. George Ryan; Eng. William Schumaker. Niko, Capt. Thomas Beggs; Eng. Luke Manion. Schr. Annabel Wilson, Capt. W. A. Edgar; Aloha, Capt. W. McCarter; Annie M. Peterson, Capt. Charles Bough.

J. A. CALBICK & CO., Chicago—Str. Oregon, Capt. Larsen; Eng. George Ingham. James H. Prentice, Capt. R. T. Evans; Eng. F. R. Winkle. Kalkaska, Capt. H. S. Shackett; Eng. Edward Jubenville. Schr. R. L. Fryer, Capt. Emil Christen; Oak Leaf, Capt. A. Hansen; Middlesex, Capt. Paul Weimer; Halsted, Capt. John Lundberg; S. H. Foster, Capt. James Curran.

CANADA ATLANTIC TRANSIT CO., Chicago, George J. Harris, general western agent.—Str. George N. Orr, Capt. William Baxter; Eng. A. W. Wilcox. Arthur Orr, Capt. John Massey; Eng. J. T. Goulding. Kearsarge, Capt. J. McDowell; Eng. L. Sebastian. William H. Gratwick, Capt. James Hulligan; Eng. D. J. Lewis. Ottawa, Capt. Alex. Birnie; Eng. G. F. Booth.

EDWARD HINES LUMBER CO., Chicago.—Str. Santa Maria, Capt. W. D. Hamilton; Eng. J. E. Padden. S. S. Wilhelm, Capt. William Roach; Eng.——. Cormorant, Capt. John Milne; Eng. A. W. Carlisle; Oscoda, Capt. William Disher; Eng. Frank Nold. Louis Pahlow, Capt. Samuel McCann; Eng. W. A. Eddy. Schrs. Wayne, Capt. Eli Jacques; S. E. Marvin, Capt. C. K. Moore; Galatea, Capt. Alfred Germain; Nirvana, Capt. Lars Madsen; Norris, Capt. Edward Biddlecomb; Ida Corning, Capt. Peter Edgar; D. L. Filer, Capt. Horace Acres; Delta, Capt. John Bates; City of Chicago, Capt. Fred Anderson.

THE GEORGE HALL COAL CO., Ogdensburg, N. Y.—Str. Hecla, Capt. D. Hourigan; Eng. D. Doyle. Tug Proctor, Capt. W. A. Russell; Eng. A. E. Cline. Hall, Capt. Jos. Richards; Eng. R. G. Jardin. Curlew, Capt. P. J. McGrath; Eng. Geo. M. Cline. Schr. Sherman, Capt. Matt Hourigan. Bolivia, Capt. Jos. Gooden. Lyon, Capt. S. LaFlam. Mathews, Capt. F. D. Lum. Beals, Capt. George Cote. Barge Diamond, Capt. W. H. Johnson. Mohawk, Capt. Laurent Vernier. Onondaga, Capt. P. P. Leduc. Thrush, Capt. Isidore Brunett. Lapwing, Capt. Jos. Leduc. Hiawatha, Capt. E. Leduc. Argosy, Capt. John Gokey.

A. BOOTH PACKING CO., Chicago.—Str. S. B. Barker, Capt. Duncan Clow; Eng. Freeman Briggs. F. R. Anderson, Capt. Thomas Hadland, Eng. A. Scott. T. H. Camp, Capt. John Anderson; Eng. George McNeal. Duchess, Capt. William Wood, Eng. William Goodwin. Louisa, Capt. David Wood; Eng. W. Hendrick. Sea Wing, Capt. Oscar Cornelius; Eng. Charles Mason. Harrow, Capt. A. Valier; Eng. Thomas Mahoney. Hiram R. Dixon, Capt. J. F. Hector; Eng. James E. Evans. Hunter, Capt. E. S. Smith; Eng. George Belloir. Valiant, Capt. D. F. McCauley; Eng. F. C. Rick. Peter Coates, Capt. J. Casey; Eng. F. Burgess. William Maxwell, Capt. J. A. Dahlmer; Eng. George Collison. Liberty, Capt. Benjamin Lewis; Eng. James Kelley. E. W. Endress, Capt. W. B. McLean; Eng. Frank Castor. E. M. B. A., Capt. H. Troden; Eng. ——.

MARINE PATENTS.

Patents issued April 17, 1900. Reported specially for the MARINE RECORD.

647,542. Canoe. D. P. Tuck, Danforth, Me.
647,543. Movable dam. W. W. Venable, Charlestown, W. Va.
647,560. Signaling apparatus for vessels. O. E. Eaton, Boston, Mass.
647,567. Feathering Paddle-wheel. Orange Jull, Toronto, Canada.
647,591. Boat. H. M. Williams, Fort Wayne, Ind., assignor of one-forth to Franz Burger, same place.
647,610. Marine torch. W. H. Rose and G. H. Holmes, Baltimore, Md., assignors to the Marine Torch Co., of Baltimore City, of Maryland.
647,630. Life-preserving float. Max Peschmann, Waldenburg, Germany.
647,638. Wave-motor. G. N. Todd, Los Angeles, Cal.
647,703. Sail-boat. J. P. Pool, New York, N. Y.
647,774. War-ship. G. W. Van Hoose, Tuscaloosa, Ala.
647,776. Ship's log. T. F. Walker and T. S. Walker, Birmingham, England.
647,777. Boat securing and launching apparatus. Robert White, New York N. Y.
647,813. Insubmergible boat. Louis Dolone, Marseilles, France.
647,892. Operating bilge-pumps. Frederick Stuth, Somer's Point, N. J.
656,815. Surf motor. S. H. Emmens, New York, N. Y.
646,859. Vessel. W. B. Motheral, North McGregor, Ia.
647,296. Dry-dock. F. C. Lang, Hoboken, N. J.
647,322. Revetment. J. I. Newburg, Vicksburg, Miss.
647,449. Marine tram. E. W. Johnston, Seattle, Wash.

TUBULOUS BOILERS.

(The Marine Engineer, London.)

It is being whispered about that in the navy the life of the tubes of a water-tube boiler, and particularly of the Belleville boiler, may be measured by a few months only, even when things go fairly well. They bend, crack and explode, they burn easily if salt water has been in them, and they scale and corrode by pitting very easily. The latter form of destruction and weakening is difficult to ascertain in small tubes, except by cutting out, until the weakness shows by explosion. At the present time there is a torpedo-boat destroyer in the Keyham basin, with all her boiler tubes removed, undergoing re-tubing, and yet this boat was commissioned for the last year's manœuvres as a new ship. She went as far as Portsmouth with various mishaps, and then struggled back to Devonport. At Devonport she was paid off into the Reserve Fleet, and has been in the Reserve Fleet ever since. This is, no doubt, an exceptional case, and the extreme destruction to the tubes must have been developed for a long time. Perhaps the explanation in this case may be found in the fact that many contract-speed boats amongst the destroyers take years to build and pass their trials. During all this time the boilers are more or less in use intermittently, and between times are probably neglected as being nobody's business. Nothing determines scaling and corrosion more rapidly than the boilers being intermittently used with air access between trials. Thus it is probable that many destroyers, when at last their various amendments and alterations have been completed and their trials at last passed, and are then delivered as new boats to the navy, have already the tubes of their boilers hopelessly rusted, scaled and pitted. Apart, however, from such an extreme instance, the rapid deterioration of the tubes of water-tube boilers is a most serious problem for naval engineers. The commercial marine engineer depends largely on artificial scaling with a sulphate of calcium deposit to protect his water surfaces from further corrosion and pitting, but the art of obtaining such a coating at once and permanently is known only to a few experienced hands; and what could be readily effected, with little injury to the value of the heating surface, in large Scotch or ordinary marine tubular boilers may not be so readily effected in the multiplicity of the small tubes of a water-tube boiler. The bending and movement of such slight tubes also would tend to crack off such protective coating if obtained, and the high rate of evaporation required in these water-tube boilers would more sensibly show the retarding effect of such a coating on evaporation. We badly want boiler tubes either of necessary strength in a material which will resist such corrosion, or we want some process applied to their interior such, for instance, as the Barff oxidising blast, which will check all corrosion without injury to the tube as an evaporative unit. Should such protection against corrosion not be attainable, then special precautions must be observed to prevent the access of air with the feed water or to the tubes when not in use, to limit as much as possible destruction by oxidation The Babcock and Wilcox are perhaps in the same category

UNJUST TO SAILING SHIP MASTERS.

It is required of the Board of Supervising Inspectors of Steam Vessel to meet once a year, and when necessary in their judgment, to formnlate rules and regulations for the safety of the navigation of steam vessels, and when such rules are approved by the Secretary of the Treasury they have all the force of an act of Congress. This board is composed of eleven men, including the Supervising Inspector-General, the presiding officer, all of whom we believe to be intelligent, practical and competent officers. How such an unjust, impracticable rule as that which requires a sailing ship master to have three years' experience on a steamship before he can obtain a license to command a steamer, could have passed this board at its session in January last is incomprehensible.

Flint, Dearborn & Co., of this city, are building four 10,000 ton steamships to run between this port, San Francisco and Honolulu. Anticipating their coming out this summer, they have disposed of their large sailing fleet and have already selected four of the late masters of these ships to command the new steamers. There are no men to be found anywhere that would carry with them to these steamships a riper seafaring experience, more skillful management, or make better caretakers of this valuable property. Every mariner knows that a steamship man who had never been in a sailing vessel would make a sorry mess of it as a master at first, while our best steamship men have stepped from the quarter-decks of sailing ships to that of a steamship, giving immediate satisfaction, and found the navigation of the steamer play in comparison with the navigation and handling of the sailing ship. We have few steamship men familiar with the route on which the steamers referred to are to run, excepting through the Straits of Magellan, and at least one of Flint's captains has been sent down there to familiarize himself with that. The sailing ship men selected as masters of their steamers know the route to the Pacific well, and to deprive them or others of their class of engaging in this or any other steamship command unless they serve three years in a subordinate position, is a hardship that the government should not impose. It is to be hoped that the Secretary of the Treasury has the legal authority to rescind his approval to their rule, as we understand that the Supervising Inspector General, after a thorough investigation as to its impracticability, would favor its modification if it were legally possible.—The Marine Journal, New York.

CONSULAR REPORTS.

PROPOSED SHIPYARD IN VENICE.

The preliminary agreement has just been signed between the municipality of Venice and a company of Italian capitalists for the erection of shipbuilding works on the island of Sant' Elena.

As Sant' Elena is an almost deserted tract of land at the eastern extremity of this city, the work of installing the plant can be begun almost immediately. American manufacturers who would be interested in supply machinery and materials should therefore communicate at once with the subscribing capitalists.

The enterprise will be under the general direction of Commendatore Bigliati, of Venice, formerly directing-general of construction in the Italian navy. Other promoters of the scheme are Count Papadopoli, Baron Treves, Cavaliere De Benedetti, Cavaliere Ernesto Breda, and Commendatore Giuseppe Da Zara, of Venice; Gaetano Romiati, of Padua; and Cavaliere Eugenio Scartezzini, of Genoa.

Subscriptions have already reached the figure of 6,000,000 lire (about $1,080,000), from which it may be inferred that the company has large plans in view. It is intended to supply the local steamboat companies with additions to their existing fleets, to offer dock accommodations to visiting vessels, and eventually to lay down the largest craft to order.

The backers of the enterprise are of the highest standing in the business community, so that our exporters need not feel the slightest hesitation in making immediate proposals.

H. ABERT JOHNSON, Consul.

Venice, January 26, 1900.

PROPOSED STEAMSHIP LINE TO FRANCE.

A line of steamers to ply between Philadelphia and the ports of the River Loire—namely, Nantes and St. Nazaire—is now being seriously considered. I am assured by those interested that enough encouragement has already been given the project to warrant its success. About two years ago, an effort was made to establish a line between Philadelphia and either Bordeaux or Marseilles; but, on account of opposition from parties interested in the lines from New York to Bordeaux and Marseilles, the project was abandoned so far as the latter ports were concerned. At that time, the projectors of the enterprise received much encouragement from commercial organizations and business men of Philadelphia.

A glance at the map of France will convince one that the entrance to the River Loire is the most logical eastern terminus of a French line. Nantes is much nearer Paris than either Bordeaux or Marseilles. Here, vessels may discharge cargoes into the cars of two of the leading railroads in France, namely, the Chemins de fer de l'Etat and Chemins de fer d'Orleans. The largest ocean steamers may enter the harbor at St. Nazaire, and vessels of 4,000 tons may come up the River Loire as far as Nantes.

A line of coast steamers from Spanish and Mediterranean ports, as well as from ports of England and the north of France, will connect at St. Nazaire with the proposed Philadelphia line, which will be known as Le Compagnie Maritime de l'Atlantique.

At present, there is no steamship line plying between Philadelphia and any French port, and the establishment of such a line would certainly benefit American commerce. Large quantities of merchandise come from Philadelphia to France via Liverpool, thus increasing the tariff charges by indirect shipments, and almost doubling the time in transit as compared with a direct service.

The Department of the Loire-Inferieure has a population of more than 750,000, and the vast and varied manufactories along the river would no doubt afford a market for our raw material, such as coal, phosphate, petroleum, iron ore, and stave wood. American goods which have been introduced here find a ready sale and give good satisfaction, but the people naturally wish to see samples before making other purchases. If an effort were made, the United States could obtain much of the trade which now goes to England, Germany, and Austria. Americans wishing further information regarding the proposed steamship line should correspond with Capt. Francois Berginal, No. 10 rue Gresset, or A. J. Gauin, 24 Quai de la Fosse, Nantes.

JOSEPH I. BRITTAIN, Consul.

Nantes, January 24, 1900.

NEW GERMAN STEAMSHIP.

The Deutschland, launched at the Vulcan Yards, in Stettin, on January 10, 1900, is intended to be a record breaker. The Hamburg-American Line, on whose account the steamer is being built at a cost of 14,000,000 marks ($3,332,000), expects to have her in service between New York and Hamburg the coming summer, as a competitor to the Kaiser Wilhelm der Grosse, of the North German Lloyd line.

The following description will give an idea of the stupendous proportions of the new steamship: Length over all, 684 feet; beam, 67 feet; molded depth, 44 feet; displacement, loaded, 23,200 tons; measurement, 16,200 tons registered; horsepower, 33,000; weight at time of launching, 9,300 tons.

The Deutschland is built according to the German Lloyd requirements for highest register of the four-deck-ship class, with her steering gear and rudder protected and under water line in compliance with instructions from the Imperial Navy Department, at whose disposal the ship would be in the event of war, as a cruiser.

Steam is supplied from 12 double and 4 single boilers, with 112 fires, which drive 2 six-cylinder quadruple-expansion hammer engines of 33 000 horse-power. The 2 propeller shafts are each 40 meters (131.23 feet) long and 630 millimeters (24.8 inches) in diameter; each of the bronze propellers being 7 meters (22.96 feet) in diameter.

The ship has a double bottom extending i s entire length, which is divided into 24 compartments; 15 exceptionally strong bulkheads extending from keel to main deck and 1 longitudinal bulkhead in the engine room divide the steamer into 17 water-tight compartments. It is claimed that if 2 adjoining compartments were to fill with water the ship would not sink. The Deutschland is supposed to have accommodations for 1,057 passengers and a crew of 525.

There are 263 first-class cabins, 99 second-class cabins, and accommodations for 290 steerage passengers.

The first-cabin dining saloon is located amidship on main deck and has a seating capacity of 362.

As a matter of interest in connection with this report, I submit a table giving the dimensions of the largest steamers:

Name of Ship.	Date.	Length over all	Beam.	Depth.	Draft.	Displacement.	Speed.
		Ft.	Ft.	Ft	Ft.	Tons.	Knots.
Great Eastern	1858	692	*83	57½	25½	27,000	14.5
Paris	1888	560	63	42	26½	15,000	20.5
Campania	1893	625	65	41½	28	19,000	21.8
Kaiser Wilh'lm der Grosse	1897	649	66	43	29	20,000	24.6
Oceanic	1899	704	68	49	32½	28,500	20
Deutschland	1900	684	67	44	†30	23,200	†23

* Over paddle box. † Estimated.

Stettin, Jan. 15, 1900. JOHN E. KEHL, Consul.

SHIPBUILDING IN ENGLAND AND GERMANY.

Under date of January 17, 1900, Vice-Consul Murphy, of Bremen, sends the following translation of a German newspaper clipping:

In 1898, shipbuilding in England was more important than it had ever been before. In 1899, the business was still a little larger. The high figures in 1898 were due to a decrease of business in the preceding year caused by a strike of machine builders; but this does not explain the continued growth in 1899, which was undoubtedly caused by the continued development of shipping interests.

During the past twelve years, merchant vessels have been launched as follows:

Year.	Steamers.		Sailing Vessels.		Total.	
	No.	Gross tons.	No.	Gross tons.	No.	Gross tons.
1888	468	757,000	81	80,000	539	838,000
1889	595	1,083,000	95	125,000	690	1,209,000
1890	651	1,061,000	92	133,000	743	1,194,000
1891	641	878,000	181	252,000	822	1,130,000
1892	512	841,000	169	268,000	681	1,109,000
1893	438	718,000	98	118,000	536	836,000
1894	549	964,000	65	81,000	614	1,046,000
1895	526	904,000	53	45,000	579	950,000
1896	628	1,113,000	68	45,000	696	1,159,000
1897	545	924.000	46	28,000	591	952,000
1898	744	1,363,000	17	4.000	761	1,367,000
1899	714	1,414,000	12	2,000	726	1,416,000

In 1899, only 12 small sailing vessels were built, having an average gross tonnage of 167 tons. These are accordingly hardly worth considering. On the other hand, the average steamship has a gross tonnage of 2,000 tons, the total for the year being nearly 1,500,000 tons.

The English shipbuilders accordingly produced in this one year, exclusive of war vessels, only one-fifth less than the entire steamship fleet of Germany. To this must be added the war vessels, aggregating 168,000 tons, against 191,000 tons in 1898 and 95,000 tons in 1897. Of the former, 121,000 tons were added to the English war fleet. Most of the remainder were for the Japanese navy (42,000 tons), while 4,000 tons were for the United States. The total output of the shipyards was 1,584,000 tons gross.

Of the immense mercantile fleet, 1,149,000 tons were for Great Britain and 18,000 tons for its colonies. Of the remainder, the largest part (68,000 tons, against 37,000 in 1898) was for Germany, which, although it occupies the first place after England in shipbuilding, is nevertheless England's best customer. Austria took 37,000 tons; Norway, 28,000 tons; Spain, 26,000 tons; Denmark, 24,000 tons; Holland, 22,000 tons; Russia, 15,000 tons; Sweden, 9,000 tons; etc.

Lloyd's bureau in London reports, also, concerning shipbuilding in other countries, and shows a total production of 881,000 tons—namely, 503 merchant vessels and 56 war ships.

For several years Germany has been at the head of this list, being excelled only in 1898 by the United States, owing to the latter's activity in building war vessels. But Germany is again at the head. The principal countries are shown in the following table:

Country.	Tons.	
	Total.	War Vessels.
Germany	252,000	40,000
United States	233,000	9,000
France	155,000	66,000
Italy	67,000	17,000
Russia	34,000	29,000
Holland	39,000	5,000
Denmark	30,000	3,000
Norway	28,000	.....
Sweden	11,700	1,300
Austria	11,500	2,300

In building merchant ships the United States is this year again ahead, its production being 224,000 tons, while Germany's was 212,000 tons.

Furthermore, this estimate is higher than that of the Bureau Veritas, at Hamburg, which gives Germany only 178,500 gross tons. According to the English estimate, the British production was in 1899 seven times as large as that of Germany.

Of the steamships built in England, 9 were of over 10,000 tons gross register, 4 between 9,000 and 10,000 tons, none between 8,000 and 9,000 tons, 9 from 7,000 to 8,000 tons, 15 from 6,000 to 7,000 tons, 27 from 5,000 to 6,000 tons, and 39 from 4,000 to 5,000 tons. The largest ships launched were the Oceanic, of 17,274 tons; Ivernia, of 13,900 tons; Minneapolis, of 13,750 tons; Saxon, of 12,970 tons; Saxonia, 12,750 tons; Persic, of 11,973 tons. Germany produced the Patricia, of 13,293 tons; Grosser Kurfurst, of 12,500 tons; and 6 other steamers of over 10,000 tons.

Of the English shipbuilding centers, Glasgow, with 290,000 tons (inclusive of war vessels), remains at the head. Then follows Newcastle, 279,000 tons; Sunderland, 242,000 tons; Greenock, 172,000 tons; Middlesborough, 146,000 tons; Belfast, 132,000 tons; Hartlepool, 128,000.

The following table, prepared by the Bureau Veritas, in Hamburg, shows the number of merchant vessels launched in and for Germany in 1899:

Where Built.	Steamships.			Sailing Vesse's.	
	No.	Register.		No.	Register.
		Gross.	Net.		
In Germany:		Tons.	Tons.		Tons
For German acct.	58	154,137	96571	18	5,726
For foreign acct.	10	17,002	10216	10	1,710
Abroad:					
For German acct.	19	47,027	29936	17	2,637
Total	87	218,166	136723	45	10,073

The growth of shipbuilding in Germany is shown in the following table, the figures representing gross tonnage:

Year.	Steamships.	Sailing Vessels.	Total.
	Tons.	Tons.	Tons.
1896	.....	.....	105,078
1897	102,939	12,430	115,369
1898	139,151	8,727	147,878
1899	171,139	7,436	178,575

The following table relates to vessels in course of construction in the English shipyards at the close of the years indicated:

Year.	Not finished at end of year.		Begun in fourth quarter of year.	
	Ships.	Register, gross.	Ships.	Register, gross.
		Tons.		Tons.
1896	390	784,000	196	391,000
1897	505	1,013,000	168	316,000
1898	560	1,401,000	187	432,000
1899	538	1,306,000	165	335,000

The number of sailing vessels covered by the last table was so small as not to be worthy of special mention.

INTERNATIONAL MARINE CONGRESS AT PARIS.

The newspaper organs of the commercial marine of France have published this week the programme for the sittings of the international marine congress which is to be held at Paris during the coming exposition of 1900. All the great maritime interests of the world—shipbuilders and shipowners—will be represented at this gathering.

The general statistical section will consider:

FIRST SECTION.

(1) What is the condition of the merchant marine of each country? This heading will involve a study covering the last thirty years of the progress or diminution of the commercial fleet, sail and steam, tonnage and speed, in the different countries.

(2) What is the nature of the government of the merchant marine of the various nations? How far does the government go in directing and aiding ocean and coastwise commerce? Under this heading there will be a general discussion of the question of government aid, especially in regard to the technical education of sailors, the recruitment of crews, discipline, wages of sailors, the capacity and diplomas of commanders, the location and surveillance of ships in harbor.

(3) The condition of the different great shipyards of the world; statistics of production during the last thirty years; variations in wages and cost of production.

(4) Interests to be established between the maritime business of a port and the railroads and canals touching it; the first cost of transportation by rail and water, competition of railroads and water.

(5) What are the different kinds of assistance and protection given to the merchant marine? Under this heading will be discussed maritime business reserved especially to the national flag, bounties for shipbuilding and for navigation per mile of voyage, extra bounties for speed, privileges reserved to ships built at home, exemptions and reimbursement of certain taxes, bounties to postal and to regular lines.

(6) What are the relations between the merchant marine and the navy? The obligations of officers and sailors in time of war; the utilizing of merchant ships as cruisers, scouts, transports, auxiliaries, and ambulance boats; special subsidies accorded such ships; the requisition of ships.

SECOND SECTION.

(1) What influence does a tariff exert on the merchant marine?

(2) The establishment of free ports and free zones within a port.

(3) The fluctuation of freights during a certain number of years and the cause of such fluctations. Special reference will be had to national and local marine taxes.

(4) How should gauging be unified? the different methods of guaging; determination of impossible tonnage.

THIRD SECTION.—TECHNICAL MATTERS IN SAILING.

(1) What modifications should be adopted in existing international regulations to avoid collisions. Discussion: Improvements in signaling, lights, and maneuvering, the fixing of speed, life-saving apparatus, legal interpretation of article 9 of international regulations, obligatory sea routes in the great maritime highways.

(2) Should the amount of a cargo (la ligne de charge) be the subject of an international agreement?

(3) What international arrangements should be made to assure the safety or navigation? A discussion of ocean currents, the destruction of floating wrecks and derelicts, the movement of icebergs, ocean maps and pilot charts, wireless telegraphy, carrier pigeons, buoys and lights on dangerous coasts, the duty of rendering succor and assistance at sea.

FOURTH SECTION.

(1) What improvements can be made in the construction of and material used on a ship in order to increase its usefulness commercially? Discussion: The hull, machinery, boilers, different motor powers, fuel, coal, wood, petroleum, supply stations.

(2) The situation in regard to salaries, wages of seamen, the returning of crews to their country. Discussion: The employment of negroes, Lascars and other natives.

(3) The control exercised in different countries over marine brokerage. Discussion: Regulations, monopolies, responsibility, prices.

(4) What reforms in pilotage and towing are necessary? Discussion: The capacity and recruiting of pilots, their responsibility, the regulation of prices.

(5) What measures should be taken for the improvement, development, and neutralization of submarine cables?

FIFTH SECTION.—AID TO SEAMEN.

(1) What steps should be taken to ameliorate the material and moral condition of seafaring men? Discussion: Aid to wrecked sailors and their families, sailors and their homes, libraries and associations, free voyages, different kinds of aid and instruction.

(2) What are the best means for the organization of savings banks, relief funds, mutual-aid and mutual-insurance companies? Discussion: The role of the state in such institutions; results secured by individual initiative.

(3) What is the best hospital and hygienic service for sailors? Disscussion: Hospitals on land and sea, conditions on shipboard, different hygienic measures.

The above programme is considered very complete, and it is expected that all the great maritime nations will be represented at this congress. JOHN C. COVERT, Consul.

Lyons, January 24, 1900.

TREASURY DECISION.

AMENDMENT TO SECTION 4445, REVISED STATUTES, RELATING TO LICENSED OFFICERS OF STEAM AND OTHER VESSELS.

TREASURY DEPARTMENT,
STEAMBOAT-INSPECTION SERVICE,
WASHINGTON, D. C., April 5, 1900.

To Supervising and Local Inspectors and Others whom it May Concern:

Your attention is called to an act of Congress, approved March 23, 1900.

Inspectors of steamboats will, when they have reason to believe the law has been violated by any person applying for license as master, mate, pilot, or engineer of vessels, or that any such officer has changed the terms of his license without authority, notify the United States attorney of the district for prosecution.

Attached hereto is the text of the act referred to.

Approved: JAS. A. DUMONT,
L. J. GAGE, Sec'y. Supervising Inspector-General.

AN ACT TO AMEND SECTION 4445, OF TITLE 52, OF THE REVISED STATUTES OF THE UNITED STATES RELATING TO THE LICENSING OF OFFICERS OF STEAM VESSELS.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That section forty-four hundred and forty-five, of title fifty-two, of the Revised Statutes, be, and is hereby, amended by adding thereto the following paragraphs:

"Every applicant for license as either master, mate, pilot, or engineer under the provisions of this title shall make and subscribe to an oath or affirmation, before one of the inspectors referred to in this title, to the truth of all the statements set forth in his application for such license.

"Any person who shall make or subscribe to any oath or affirmation authorized in this title and knowing the same to be false shall be deemed guilty of perjury.

"Every licensed master, mate, pilot or engineer who shall change, by addition, interpolation, or erasure of any kind, any certificate or license issued by any inspector or inspectors referred to in this title shall, for every such offense, upon conviction, be punished by a fine of not more than five hundred dollars or by imprisonment at hard labor for a term not exceeding three years."

SEC. 2. That this Act shall take effect immediately.

Approved, March 23, 1900.

NOTICE TO MARINERS.

CORRECTION OF NOTICE TO MARINERS NO 41 of 1900.

UNITED STATES OF AMERICA—NORTHERN LAKES AND RIVERS—MICHIGAN.

TREASURY DEPARTMENT,
OFFICE OF THE LIGHT-HOUSE BOARD,
WASHINGTON, D. C., April 13, 1900.

ST. MARY'S RIVER.—North Middle Ground Gas Buoy, painted red and black in horizontal stripes, to replace the former red and black horizontally striped spar, on the easterly side of the improved channel, on the northerly end of the Middle Ground, about 800 feet N. by E. from Encampment Crib Light, will show a fixed red light during periods of 10 seconds, separated by eclipses of 10 seconds, instead of white, as stated in the previous notice.

ESCANABA LIGHT STATION.

Notice is hereby given that, on or about May 1, 1900, a fog bell will be established at this station, near the end of Sand Point, Little Bay de Noquet e, northerly end of Green Bay, to sound, during thick or foggy weather, a single blow every 15 seconds.

The fog bell structure is a frame tower, painted white, and stands about 395 feet to the eastward of the light tower.

By order of the Light-House Board.

FRANCIS J. HIGGINSON,
Rear-Admiral, U. S. Navy, Chairman

VISIBLE SUPPLY OF GRAIN.

As compiled for THE MARINE RECORD, by George F. Sto ne Secretary Chicago Board of Trade.

CITIES WHERE STORED.	WHEAT. Bushels.	CORN. Bushels.	OATS. Bushels.	RYE Bushels.	BARLEY Bushels.
Buffalo	177,000	105,000	20,000	29,000	265,000
Chicago	12,960,000	7,104,000	1,811,000	345,000	.....
" afloat	62,000	5,175,000	549,000	.....	.....
Detroit	385,000	111,000	33,000	7,000	3,000
Duluth	18,178,000	1,466,000	363,000	433,000	228,000
" afloat	345,000	.....	.....	.....	.....
Fort William, Ont.	3,615,000	.....	.....	.....	.....
Milwaukee	237,000	10,000	1,000	1,000	2,000
" afloat	.....	827,000	1,114,000	73,000	81,000
Montreal	52,000	12,000	689,000	18,000	38,000
Port Arthur, Ont.	226,000	.....	.....	.....	.....
Toledo	562,000	2,059,000	225,000	3,000	.....
Toronto	60,000	.....	4,000	.....	48,000
On Miss. River	.....	125,000	.....	.....	.....
Grand Total	55,273,000	24,789,000	7,543,000	1,311,000	871,000
Corresponding Date, 1899	30,502,000	29,708,000	11,050,000	1,369,000	1,885,000
Increase	.....	1,770,000	69,000	35,000	54,000
Decrease	139,000	.....	.....	.....	.....

While the stock of grain at lake ports only is here given, the total shows the figures for the entire country except the Pacific Slope.

SHIPPING AND MARINE JUDICIAL DECISIONS.

(COLLABORATED SPECIALLY FOR THE MARINE RECORD).

Assumption of Risks.—The risks attendant on service on a steamboat engaged in the river trade on the Mississippi, being well known to the people employed, are assumed by the crew. Red River Line vs. Smith et al., 99 Fed. Rep. (U. S.) 520.

Part Performance of Contract.—A seaman who quits ship without legal cause before expiration of time for which he shipped, is not entitled to recover as upon a quantum meruit for services rendered in part performance of his contract. The Leiderhorn, 99 Fed. Rep. (U. S.) 1001.

Damages—Personal Injury—Amount of Award.—An award of $12,000 made to a libelant who was a young man with an expectancy of more than 30 years, for an injury to his back in a collision, by which his lower limbs were paralyzed, he was caused great suffering, and would probably, as shown by the evidence, remain a helpless cripple through the remainder of his life. The Homer, 99 Fed. Rep. (U. S.) 795.

Seamen—Right to Leave Ship—Refusal to Furnish Warm Room.—The refusal of the captain of a vessel to furnish a warm room for the use of the seamen in cold weather, as required by act Dec. 21, 1898, (30 Stat. 755), after complaint made to him, is a breach of the shipping articles which justifies the men in leaving the vessel before the expiration of their term of service, and entitles them to recover wages for the time served. The Ida McKay, 99 Fed. Rep. (U.S.) 1002.

Collision—Defense of Inevitable Accident.—To exonerate a steamer from liability for an injury resulting from a collision with a vessel moored at a wharf on the ground of inevitable accident arising from a latent defect in her machinery, it must be shown that such defect could not have been discovered by a person of competent skill in the exercise of ordinary care, and, further, that such defect necessarily caused the accident. The Homer, 99 Fed. Rep. (U. S.), 795.

Failure of Electric Lights.—The owner of a steamboat engaged in the river trade on the Mississippi is not liable for the death of a servant who fell overboard while unloading cotten at night from a barge onto the steamboat, because of the failure of the electric lights, which was not shown to have been the fault of the owners or the master, but was an incident common to the employment of such lights, where the lard-oil hand lanterns furnished as a substitute were the best that could be obtained, and formerly were considered fully sufficient for the purpose. Red River Line vs. Smith et al., 99 Fed. Rep. (U. S.) 520.

Suit for Personal Injury—Contributory Negligence.—Libelant was at work on a vessel moored to a wharf, when she was struck by a steamship. The steamer sounded no warning and libelant did not know of her approach until immediately before the collision, and when called to, he turned to pick up his coat, which contained a check, before starting to leave the vessel, and before he could reach the wharf the vessel was struck, and he was seriously injured. Held, that the fact of his momentary delay to rescue his coat was not a defense to an action against the offending vessel to recover for his injuries. The Homer, 99 Fed. Rep. (U. S.) 795.

Salvage—Amount—Towing Services.—A sailing ship valued at $60,000, was in imminent danger of being destroyed by fire, which had started in the sheds on a wharf near which the ship lay. She was on fire in several places, when a tug ran up under her bow, took a line from the ship and towed her away immediately. There was no difficulty in towing the ship, and after the two vessels left the wharf the peril was over. The iniury to the ship did not exceed $150. The value of the tug was not more than $3,500. If the tug had not been present, a fire boat would have performed the services. The tug was at no time in danger. Held, that $2,500 should be awarded the tug as salvage. The Peru, 99 Fed. Rep. (U. S.) 793.

Marine Insurance—Perils of the Sea—Injury to Boat in Tidal Harbor—Construction of Policy.—A gully six feet wide and three feet deep, near the dock in a tidal harbor, through which there was a running stream, even at low tide, caused a canal boat to take a malposition when the tide left it, so that one-half of the width of the boat rested on the bank of this stream, while the other half was over the stream to the aft side, and the boat shifted and leaned over to that side, and was so injured that it was not worth repairing. Held, that the injury was caused by the perils of the sea, within the conditions of a policy of marine insurance, and entitled the owner to recover the loss. McNally vs. Insurance Co. of North America, 63 N. Y. Supp. 125.

Labor and Materials for Repairing Ship.—Such statue does not give a lien for repairs furnished to a vessel under instructions from one who was neither owner, master, charterer, consignee, nor agent, and who had no interest in her, except under a contract with the owner, by which he agreed, at his own expense, to make certain repairs necessary to fit her for a different service, after which he was to employ her for a specified time as charterer, repaying himself for his expenditure, and dividing her earnings with the owner, of which facts the lien claimants were fully advised by the owner, and notified that they could not look to the vessel for payment. The Catherine Whiting, 99 Fed. Rep. (U. S.) 445.

MARINE RECORD

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CLEVELAND, O., APRIL 19, 1900.

CAPT. THOS. WILSON, Cleveland, has been laid to rest this week. We can never find his equal and regret his departure.

THE Gulf and Mississippi River Transportation Co. has been incorporated by Chicagoans for the purpose of maintaining a line of barges on the Mississippi river at various points from the Gulf to Northern points. The incorporators are Thomas K. Christie, who is connected with Gulf coast companies and the Gulf and Mississippi Packing Co., Wm. Hardy and Harry Flyton. The companies mentioned have operated barges on the Mississippi for some time.

WE ARE in receipt of the resume of his case before the River and Harbor Committee, from Col. C. P. Goodyear. It is a masterly document. Mr. Goodyear is deserving of every reasonable consideration from the Government, on the grounds of his own plea to the effect that the man who created the Brunswick deep water channel, against constant opposition and during a period of unprecedented financial depression, should receive just and even generous recognition from Congress.

HEREAFTER persons making application for license to the Local Inspectors of Steam Vessels should be very careful that every statement in connection with their papers is correct, as there has recently been an act passed by Congress holding any person who shall make any oath or affirmation under this act, knowing the same to be false, or who shall make any addition, interpolation or erasure of any kind on any certificate or license, issued by any inspector, the auther will be considered guilty of perjury and upon conviction punished by a fine of not over $500, or imprisoment at hard labor for a term not exceeding three years.

MAJ. T. W. SYMONS, Corps of Engineers, U. S. A., stationed at Buffalo, has contributed an article to the April Forum on "Canals from the Great Lakes to the Sea," which contains a vast amount of information upon this most important subject. In treating the subject Maj. Symons asserts that the only practical route for a canal from the Great Lakes to the Atlantic seaboard, entirely within the limits of the United States, is possessed by the State of New York. He also shows that in trying to find the correct solution of the problem, it early became evident that certain interests demanded one kind of canal, while other interests demanded a different kind of a canal. In this article all factors have been carefully weighed, and the following four different classes of canals are described and considered: A great ship canal suited to ocean-going vessels, a ship canal suited to vessels navigating the Great Lakes; a barge canal suited to vessels of 1,000 to 2,000 tons burden; and a small canal suited to vessels of 250 to 500 tons burden.

THE United States postal authorities are at the present time calling attention to the matter of short-paid letters. This is of special importance now in view of the increased correspondence due to the Paris exposition. The letter rate is 5 cents per ½ ounce on foreign mail, and deficient postage is charged double. Many foreign houses have standing orders to refuse all underpaid mail matter, and much inconvenience and uncertainty results from negligence in this matter. Another cause of delay and loss of letters is the use by Americans of written characters unfamiliar to French, German and other postal employees. All envelopes should be addressed by a typewriter or by a pen in imitation of printed letters.

THE actual cost of transporting iron ore from Lake Erie to Pittsburg under the most favorable conditions has been determined. The Pittsburg, Bessemer & Lake Erie road, extended for the express purpose of carrying iron ore from Conneaut harbor, Lake Erie, to the Carnegie furnaces in the Pittsburg district, established last year a rate of 98 cents. It is said to have carried about 75 per cent. of the Carnegie requirements and the annual report submitted last week showed gross earnings of $1,854,287, but above operating expenses, taxes and charges only $20,700 remained for the stockholders. Some of the latter were dissatisfied with the results and sold their holdings to the Carnegie Steel Co. Competing roads, which last season adopted the ninety-eight cent freight rate made an advance this year.

WE have announced that the rules for the navigation of St. Mary's river will this season be more rigorously enforced than ever. The rush to get down iron ore will be greater than in 1899, and the temptation will be for the masters of vessels to sail through the channels of the river at a higher speed than permissible by law. The two stoppages to navigation last season by the stranding and wrecking of vessels in the narrow passages proved how disastrous a little carlessness might be to the entire lake trade. Capt. A. B. Davis, of the revenue cutter Morrill, has been instructed to station men at Sailors' Encampment, Hay Lake Dyke and Island Cut, and watch day and night the passage of steamers through those channels. Any infraction of rules will be promptly punished. This is a safeguard that is especially needed this year.

THE Erie canal survey bill has been signed by the Governor of New York State appropriating $200,000 for the survey work, which will begin under the direction of the engineers on May 1. The work will be commenced under the enlargement and improvement plan suggested by the canal advisory commission, of an Erie barge canal, and the enlargement of the Oswego and Champlain canals. The widening and deepening of the Erie canal to the dimensions of a barge canal makes necessary the building of big hydraulic lifts at Lockport and at Cohoes, and experts are to determine the cost of these hydraulic lifts and also to determine the waste of water. This is a movement to head off the apparent determination of the Dominion government and business men of Canada to isolate New York State from western traffic and reduce its manufacturing interests to favor those of Canada.

NEW ARMOR FOR THE NAVY.

One of the features of the report of the House Committee on the Naval Appropriation bill is the recommendation that 7,359 tons of the "so called Krupp armor" be purchased for the battleships Maine, Ohio and Missouri. The construction of these three ships was authorized in the act of Congress of May 4, 1898, but the work of completion has been delayed because of the Navy Department's inability to contract for armor plate within the limit of price fixed by Congress. The first keel plate of the Maine was laid on February, 1899, and the Chief of the Bureau of Construction reports that if the delivery of the armor is such as to facilitate the progress of the hull work it is probable that the ship can be ready by the builders on June 1, 1901. The Ohio's first keel plate was laid on April 22, 1899, and it is believed that she could be ready for delivery by March, 1902. The Missouri is about in the same condition as the Ohio.

The proposition to protect these ships with the Krupp armor was originally suggested by the Navy Department soon after the act authorizing their construction, it having been learned that Herr Krupp had perfected a new process for the fabrication of armor plate at his ordnance works at Essen, Germany, that gave a product much superior to Harveyized armor and revolutionized the balistic standard. This new process armor was the result of years of experiment and the expenditure of much money. The test of the first plates was made at Meppen, Germany, in 1895 and subsequent tests were made before the ordnance engineers of the European admiralties which showed from 20 to 30 per cent. more resistance to the attack of armor piercing projectiles than Harveyized armor. Following these tests the new armor was adopted by England, France, Russia, Japan and Germany. Herr Krupp then offered the manufacturing rights to the armor makers of the world, stipulating the payment of a large sum for the license, and in addition for $40 to $50 a ton as royalty on every ton manufactured. The Carnegie Steel Co. and the Bethlehem Iron Co. contracted for the exclusive manufacturing rights of America under Herr Krupp's terms, and then sent their experts to the Krupp works, in Essen, to be instructed in the details of the new process.

OUR NEW NAVY.

The appropriation recently reported by the House Naval Committee carries over $61,000,000, or about the same amount as that provided in last year's appropriation, which was $64,354,735. These large annual appropriations for the navy are far in excess of what they were prior to the Spanish war. They indicate the adoption of a new policy in respect to the navy. The House Committee in its report recommending a large appropriation says:

We have a navy to-day which includes a considerable number of vessels of every class, and ship for ship it will equal that of any navy in the world. Seventeen years ago we had practically no facilities for building ships, and what we had were discredited. We were obliged to buy our armament and armor, and even in one case our plans, from foreign countries. Today we are not only building ships in American shipyards, of American material, by American labor, on American plans, for ourselves, but also for some of the leading nations of the world. Such has been the advance which has been made in naval progress in our own country.

The question may be asked: What shall be our future naval policy? Let us build as we have been buildlng—gradually, on broad lines, and upon the most advanced ideas of naval construction; not so fast that we will be ahead of the advance of naval progress, but slow enough to secure all the benefits of new improvements and new inventions; or, better still, to do as the American navy has always done when given an opportunity—to lead the march of the best naval construction.

NAVAL RESERVE DRILLS.

Captain Southerland, in charge of the naval militia has made up the itinerary for the summer cruises of the naval militia organizations of the states bordering on the Great Lakes.

All of these are to be made on the old gunboat Michigan. She is ordered to be at Cleveland or other Ohio port as the governer of Ohio may select on June 25 to instruct the Ohio naval militia for a period of several days. She is to be at Detroit on July 9 to instruct the Michigan naval militia for the same period of time and to be at Chicago July 25 to instruct the Illinois naval militia, likewise for period of seven days. Altogether the Michigan is to be devoted to this service from June 25 to July 31. This year the ship will be under the command of Lieutenant Commander William Winder, who was last year the executive officer. He has been instructed to communicate directly with the adjutant general of the states named in sufficient time to complete all necessary arrangements.

It is expected that the Yantic will be used in connection with the Michigan in the land drill of the Michigan naval militia. It is also intended to land a portion of regular crew of the Michigan at Fort Wayne barracks and embark an equal number of the naval militiamen for a seven day cruise.

It is understood that Commander Swift is to succeed Commander Mackenize in command of the cruiser Prairie, which has been designated to accompany the naval militia of the Atlantic and Gulf states in their summer cruises.

URGENCY APPROPRIATIONS.

The river and harbor committee has determined on several questions of general policy regarding emergency work, that requires early attention. It has been decided to recommend an emergency appropriation bill exceeding $500,000, to be expended by the chief of engineers, General Wilson,

for the channels of navigable streams which have been choked with rock, proving a menace to river traffic as in case of the Shrewsbury river near Long Branch.

The committee also considered the advisability of recommending amounts for not exceeding three places, where the needs are exceptional and even critical, viz., the South Pass of the Mississippi, the connecting waters between Lake Huron and Lake Superior and the Columbia river, Oregon. The South Pass emergency work could be carried on for about $150,000 and would not involve the whole project. The work on the lakes contemplates a new channel by way of Lake St. George to relieve the congestion on the present Sault Ste. Marie channels.

Senator McBride, of Oregon, who was before the committee, with a number of telegrams stated the level of the Columbia had been lowered from 30 to 24 feet, and urged an emergency appropriation. The committee is considering these latter items and probably will allow them because of the pressing needs involved. The committee does not propose, however, that this shall open the door to any work outside these three emergency items.

TOLEDO HARBOR REGULATIONS.

TOLEDO, OHIO, April 13, 1900.

To the Editor of The Marine Record:

I hand you herewith copies of the regulations for the government of the channels at Toledo and Sandusky, as amended by the Secretary of War, September 29, 1899. There is also inclosed a circular showing the time allowance between various points of the channel at Toledo, which conforms to the speed allowed. These papers are being distributed to vessels, but it will probably be of general benefit if you will call attention especially to the change in speed allowance. The speed of eight miles per hour heretofore called for has proved to be somewhat of a hardship to many vessels but they can all easily reduce to ten miles per hour without special inconvenience.

Very respectfully,

WM. T. BLUNT, U. S. Asst. Eng.

CIRCULAR.

UNITED STATES ENGINEER OFFICE,
CLEVELAND, OHIO, July 1, 1897.

For convenience of vessel masters in determining speed in passing through the Straight channel at Toledo Harbor, Ohio, the following information is issued:

At the regulation speed of ten miles per hour, which equals six minutes per mile, the time allowance in passage is:

From Outer Can Buoys Nos. 1 and 2 to Main Crib 3⅓ miles, 20 minutes.

From Main Crib to Black Spar No. 21, 2¼ miles, 13¼ minutes.

From Black Spar No. 21 to Inner Red Can No. 30, 2¼ miles, 13¼ minutes.

Total, 46½ minutes.

Amended September 29th, 1899.

JARED A. SMITH,
Colonel, Corps of Eng., U. S. A.

WM. T. BLUNT, Ass't Eng., Custodian.

Law, Rules and Regulations for the Government of The Straight Channel Through Maumee Bay, Toledo, Ohio.

The Law—Extract from Act of Congress, Aug. 17, 1894.

Sec. 4.—That it shall be the duty of the Secretary of War to prescribe such rules and regulations for the use, administration and navigation of any or all canals and similar works of navigation that now are, or that hereafter may be owned, operated or maintained by the United States as in his judgment the public necessity may require.

Such rules and regulations shall be posted in conspicuous and appropriate places, for the information of the public; and every person and every corporation which shall knowingly and wilfully violate such rules and regulations shall be deemed guilty of a misdemeanor and on conviction thereof in any district court in the United States within whose territorial jurisdiction such offense may have been committed, shall be punished by a fine not exceeding five hundred dollars, or by imprisonment (in the case of a natural person) not exceeding six months in the discretion of the court.

THE Societe John Cockerill, of Liege, Belgium, recently constructed a hydraulic dredger for the Russian government on the system of Lindon W. Bates. This was described and illustrated by Engineering, London, and an abstract published in the American Manufacturer from a Consular report. The article from Engineering is reprinted in book form and forms a valuable paper on the subject of dredging.

THE DIAMETER OF PROPELLER SHAFTS.

The Technical Committee of the British Corporation for the Survey and Registry of Shipping have issued the following new formula and rule for the minimum diameter of shafting, which practically increases the crank and line shafting by 10 per cent. in strength:

1. Diameter of Shafting.—The minimum diameters of crank, thrust propeller, and intermediate shafts may be found from the following formula, except where the ratio of length of stroke to distance between main bearings is unusual, when they will receive special consideration:

$$D = \sqrt[3]{\frac{P.L^2.S.}{C} \times B}$$

Where D=diameter of shaft.
P=absolute pressure, i.e., boiler pressure + 15 lbs.
S=stroke of engine in inches.
L=diameter of low-pressure cylinder, in inches.
B=1.0 for crank and thrust shafts.
B=.95 for intermediate shafts.
B=for propeller shafts to be taken from the following table:

Coefficient of displacement of vessel 4-5 moulded depth.	Ratio of Diameter of Propeller to Diameter of Crankshaft.					
	13	14	15	16	17	18
.6	1.0	1.01	1.02	1.03	1.04	1.05
.62	1.01	1.02	1.03	1.04	1.05	1.06
.64	1.02	1.03	1.04	1.05	1.06	1.07
.66	1.03	1.04	1.05	1.06	1.07	1.08
.68	1.04	1.05	1.06	1.07	1.08	1.09
.70	1.05	1.06	1.07	1.08	1.09	1.10
.72	1.06	1.07	1.08	1.09	1.10	1.11
.74	1.07	1.08	1.09	1.10	1.11	1.12
.76	1.08	1.09	1.10	1.11	1.12	1.13
.78	1.09	1.10	1.11	1.12	1.13	1.14
.80	1.10	1.11	1.12	1.13	1.14	1.15

The value of the divisor C in the formula depends on the ratio $\frac{L_2}{H^2}$ where L = diameter of low-pressure cylinder, and H of high-pressure cylinder in inches, and the ratio for two, three, and four crank engines, triple and quadruple-expansion, are given in a lengthy table accompanying the rule.

2. The webs of built crankshafts should be keyed as well as shrunk on to the shaft, and the diameter of the shaft should be increased in the way of the web, to make up the loss of sectional area at the keeway.

3. Propeller shafts should be forged from ingot steel or from rolled iron bars of good quality, and not from scrap. Liners should be fitted in one length, but if not so fitted, the space between the liners must be protected by efficient lapping. Joints in brass liners should be fused. Care must be taken to avoid abrupt changes of strength at any part of the length of the shaft.

New Clause in Rules of Special Periodical Surveys.—When the after-bearing is worn down to the extent exceeding 2 per cent. of the diameter of the shaft, it must be rebushed.

FOR PROPELLING CANAL BOATS.

J. M. Fordyce, of Detroit, has secured permission from the state board of public works for experimenting with electric propulsion of canal boats on the Miami and Erie canal. He will be permitted to select a stretch of 10 miles in the vicinity of Toledo on which to contruct his apparatus. He must begin within one year and two and a half years' time is allowed for the experimenting to be made. If desirable results can be demonstrated, he is to be given the right to operate his boats on the canal between Cincinnati and Dayton for 25 years, paying the regular tolls for the privilege.

NEW LAKE TONNAGE.

The lake tonnage given official numbers by the Bureau of Navigation, Treasury Department, Washington, D. C., during the week ended April 14, is as follows: Schooner-rigged steel tow-barge Madeira, 5,039 gross and 4,667 net tons, built in Chicago and hailing from Cleveland; schooner-rigged steel tow-barge Marsula, on the exact same lines and of the same tonnage, built at the Chicago yards for the same owners.

Steamer John W. Gates, 5,946 gross and 4,440 net tons, built at the Lorain yards of the American Ship Building Co. to the order of the American Steel & Wire Co., hailing from Cleveland, O.

Steamer Miller Bros., 13 tons, built at Toledo and hailing from same port.

The canal boat Jerry Baker, 124 tons, built in Buffalo and hailing from Hartford, Conn.

LITERARY NOTICES.

The William Powell Co., Cincinnati, O., have issued their catalogue No. 7, which is in the form of a pocket edition. It contains illustrations and descriptions of their valves, lubricators and other fittings of value to plumbers, steamfitters, etc.

"The Fluid Screw," by Paul Pacher, is a pamphlet of sixty-six pages, in German, published by A. Amonesta, Margarethenstrasze, 7, Vienna, Austria. It is a treatise upon the propellers of vessels and air ships, the sails of windmills, etc. Price 1½ marks (37 cents).

James Bonar & Co. have issued an excellent little booklet which should be in the hands of every one equipping steam boilers or using them. By the aid of illustrations and a few "fitting" remarks, attention is drawn to the fact that the best boiler on earth isn't any better than the worst if it has not good fittings to control it.

"A Simple and Practical Method for Analyzing the Movement of the Slide Valve with the aid of the Model Diagram Chart." By M. R. Conway. 27 4x6-inch pages. The Lunkenheimer Co., Cincinnati and New York. This is an exceedingly plain and direct method of showing the action of the plain slide valve. The model is a working model of cardboard, and shows the action of the eccentric and valve with great clearness. The pamphlet is for free distribution to engineers.

"Electric Wiring." By Cecil P. Poole. Leather, pocket size, 100 pages. The Power Publishing Co., World Building, New York; price $1.00. A glance through the pages of this handy little book shows that the author has made an effort to explain the computation of wiring to the unitiated, and to present in shape for convenient reference tables and formulas for the use of competent engineers. A casual examination would seem to indicate that he has succeeded in his purpose. The book includes wiring tables for alternating-current motors, and tables showing the corrected drop in inductive circuits. So far as we are aware these are the only tables of the kind as yet published.

"Hydraulic Power Engineering." By G. C. Marks. 369 5¼ x 7¾-inch pages, with 201 illustrations. D. Van Nostrand Co., New York; price $3.50 This is a very thorough and excellent treatise and covers a field in which published information is very meagre. It might have a more descriptive title, as one would be justified in supposing its field to be that of water power development. While water wheels are discussed, its main object is to cover the use of water under pressure in industrial works. The readiest way of conveying an idea of its scope is to give some of the leading chapter headings. Among these are the following: Packings for Sliding Surfaces, Pipe Joints, Controlling Valves, Platform Lifts, Cranes, Accumulators, Presses, Forging Machinery, Riveters, Pumps. All these chapters are fully illustrated with sectional drawings, and while a free but not burdensome use of mathematics is made, the information conveyed is of the most practical character. The book is of English origin.

"Condensers." A series of lecutres upon the subject, reprinted from the columns of "Power." 79 6x9-inch pages, with 33 cuts and 13 tables. The Power Publishing Co., World Building, New York. Price 50 cents. This is a very complete piece of work by the editor of "Power," in the special field of that valuable journal. The book is absolutely without padding. It contains a concise account of all matters pertaining to all styles of condensers, and not only those interested in the steam engine, but those also who have the making of books might take valuable lessons in condensation from it. The general steam problem, the saving by the use of the condenser, the conditions under which the condenser may not be used with profit, the various types of condensers for different lines of service, their construction and operation and capacities required, are all discussed in terms that any intelligent mechanic can comfortably follow. The book will be valuable not only to the seeker of general mechanical information, but also as a book of reference for the practical steam engineer.

FALLS HOLLOW STAYBOLTS are better than drilled or punched bolts in every way. Cost less, too. Average lengh of bars, 7 feet. Hole is central, and of any size desired, extending clear through the entire length of bolt, making the strength uniform. End next fire box may be closed or left open. Drilling tell-tale holes weakens staybolts and causes them to break at the vital point. Staybolts rolled hollow from the solid material are stronger and more flexible than a solid or drilled bolt. They save inspection and explosions warn automatically.—Falls Hollow Staybolt Co., Cuyahoga Falls, Ohio.

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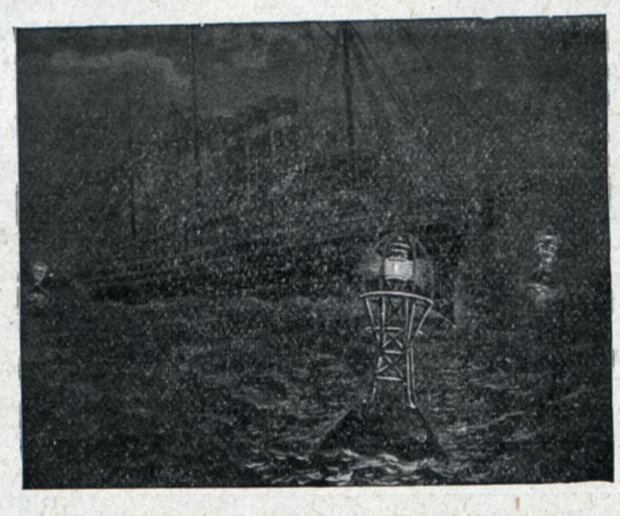

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LATITUDE BY THE ALTITUDES OF TWO HEAVENLY BODIES.

The problem is a generalization of the problem to find the latitude by double altitudes of the sun, the latter being included in the former. As a practical solution of the general problem has never been given, it may be well, first to review the attempts of scientists and navigators to solve the problem in respect to a single object, the sun.

Douve's method seems to be the oldest one, ignoring the change in the declination of the sun during the interval between observations, on account of which it is practically a failure; the more so as the method is an indirect one, requiring frequent repetitions of the reckoning to get at the final, always more or less erroneous result.

The direct method of five arcs substituted for Douve's method by approximation, and made compulsory in the examinations of masters and mates in England, labors under the same disadvantage respecting results.

As an improvement may be regarded Sumner's method of finding a ship's position at sea, making allowance for the change in the declination. Like Douve's method it is an indirect one, assuming two latitudes not widely differing from the true latitude as basis for computing the hour angles and the elapsed time between observations, and by means of the observed time interval find by the rule of three or simple interpolation the latitude.

Sumner's method has been improved upon by the English by partly substituting azimuths for hour angles. In the original method the chord, and the improved method the tangent is made to represent a curve, on account of which, when the assumed latitude differs much from the true latitude, the result found is always more or less in error. Under certain conditions the error may be as large as one-fourth the difference in the assumed latitudes, respectively the assumed and true latitude.

Although Sumner's method, the original, as well as the improved one, is applicable not only to one object but also to two objects, it lacks precision when the curve of equal altitudes differs much from its chord or tangent.

With sun, moon, the larger planets, and the stars of the first magnitude for observation, it is surprising that the method of double altitudes has been confined in practice to one object, the sun only, the observer waiting patiently for him for hours to get into position suitable for taking a second observation; while the moon all the time may be visible but is neglected, and at a clear night a multitude of objects are available, from which to select at any time a proper pair for observation.

The method of double altitudes may be likened to the method of finding a ship's position by cross bearings; celestial objects being substituted for terrestrial ones, with this difference, that altitudes are taken instead of bearings, the latter being included in the former or may be deduced therefrom. Therefore, all rules pertaining to cross bearings as to their limits, apply with nearly equal force to the position of objects used for double altitudes.

In observing two objects simultaneously results respecting latitude are instantaneous, a matter of great moment for high speed vessels, as there is no necessity of taking the ship's run into account and the time interval between observations, as is required when clinging to a single object. Ephemerids furnish all the data required for the reckoning; and as almost every vessel carries a chronometer, Greenwich time is always known aboard, and consequently also the difference of the Right Ascensions of the two objects equal to the angle at the pole; and no objections can be raised to including the moon in the list of available objects for observation.

A direct solution of the problem is furnished by spherical trigonometry in which three or four triangles play a figure, the fourth triangle only for verification, if necessary or desired. But academical solutions are not always acceptable in practice. In practice certain clear-cut, well defined rules must govern, in order to obtain correct results without fail, as it were, mechanically. A formula in the hands of a computer is a tool, the oftener it is used the more he becomes an expert in handling it. Such is the case with the well-known formula,

$$2 \sin \tfrac{1}{2} t^2 \cos b \cos c = \sin H - \sin h$$

in which t represents the hour angle, b the latitude, c the declination, H the Meridian altitude, and h the observed or ex-meridian altitude; by which formula the hour angle as well as the latitude is computed in practice.

The fact, that a large error in the latitude causes but a small error in the hour angle when the object is near the prime vertical, points directly to using the object farthest from the meridian for computing the hour angle, and by means of the difference in the Right Ascensions of the two objects obtain the hour angle of the object nearest the meridian, and from it find the latitude by "Rising." Thus, a first approximate value is obtained, with which by repeating the reckoning a second approximate value is secured; a process familiar to every navigator on the ocean. The only difficulty has been, how to find the exact value of the latitude from the true values by approximation, which difficulty is overcome by the formula,

$$\text{Correction of assumed latitude} = \frac{(\text{1st. diff})^2}{\text{1st. diff} - \text{2d. diff.}}$$

1st. diff.=1st. approx. value minus assumed value,

2d. diff.=2d. approx. value minus 1st. approx. value,

with due regard to algebraical signs.

This improvement I claim for myself; it does away with all succeeding repetitions of the reckoning otherwise necessary to obtain the exact value; it gives the finishing touch to the method of approximation without which the latter would be of very little value.

The method described holds good in any clime under all circumstances; it is not confined to certain limits, except some similar to those governing cross bearings, to remain intact, but gives reliable results even though the latitude by account be several degrees wrong. In general, the best position of two objects for observation is: one object near the prime vertical, the other within 45 degrees in azimuth on either side of the meridian.

The solution of the problem of double altitudes may be accomplished in many different ways, but there is none so easy, exact and practical as the one lined out.

The following example will show the arrangement and execution of the reckoning, using a common logarithm table.

Example. Given, latitude by Dead Reckoning 78° 0′ N; difference of Right Ascensions 60° 0′ and the following true altitudes and declinations.

Object nearest the Mer.	Objects farthest from the Mer.
Alt. 24° 58′.	Alt. 27° 41′
Decl. 15° 20′ N.	Decl. 25° 30′ N.

find the exact latitude.

FIRST APPROXIMATION.
FARTHER ALTITUDE.

Complement latitude 12° 0′ N.
Declination 25 40 N.

Meridian altitude	37 30	n, sin	0.60806
Observed altitude	27 41	n, sin	0.46458
		diff.	0.14348
		log.	9.15679
Declination	25° 30′	cos	9.95549
Latitude	78 0	cos	9.31788
log	2		0.30103
			9.57440
			9.58239
		2	
		sin	9.79120

Half hour angle 38° 11′ 32″
Hour angle 76 23 4
diff. R. A. 60 0 0
Hour angle for altitude nearest to meridian 16° 23′ 4″.

ALTITUDE NEAREST TO MERIDIAN.

Half hour angle	8° 11′ 32″	sin	9.15380
			2
			8.30760
		log 2	0.30103
Declination	15° 20′	cos	9.98426
Latitude	78 0	cos	9.31788
			7.91077
		number	0.00814
Observed altitude	24° 58′	n sin	0.42209
		cos	0.43023

Meridian Z. D. 64° 31′ 1 N.
Declination 15 20 0 N.

Latitude 79 51 1 N.

SECOND APPROXIMATION.
FARTHER ALTITUDE.

Complement latitude 10° 9′ N.
Declination 25 30 N.

Meridian altitude	35 39	n, sin	0.58283
Observed altitude	27 41	n, sin	0.46458
		diff.	0.11825
		log.	9.07280
Declination	25° 30′	cos	9.95549
Latitude	79 51	cos	9.24607
log	2		0.30103
			9.50259
			9.57021
		2	
		sin	9.78511

Half hour angle 37° 34′ 0″
Hour angle 75 8 0
diff. R. A. 60 0 0
Hour angle for altitude nearest to meridian 15° 8′ 0″

ALTITUDE NEAREST TO MERIDIAN.

Half hour angle	7° 39′ 0″	sin	9.12425
			2
			8.24850
		log 2	0.30103
Declination	15° 20′	cos	9.98426
Latitude	79 51	cos	9.24607
			7.77986
		number	0.00602
Observed altitude	24° 58′	n, sin	0.42209
		cos	0.42811

Meridian Z. D. 64° 39′ 1 N.
Declination 15 20 0 N.

Latitude 79 59 1 N.
1st Diff=79° 51′ 1 −78° 0′ =1° 51′ 1=111′ 1
2d Diff=79 59 1 −79 51 1=0 8 0= 8 0

$$\text{Cor} = \frac{111{,}1^{2}}{111{,}1-8.0} = \frac{1234321}{103.1} = 119.8 = 1^{\circ}\ 59'\ 8$$

Assumed latitude 78 0 0

Exact latitude 79 59 8 N.

The generalization of the problem of double altitudes and its solution in ship-shape form, immensely increases the facilities for instantaneously finding the exact latitude at sea, and consequently the time also; as hitherto observations for latitude have generally been confined to meridian altitudes, altitudes near the meridian, the pole star, and to double altitudes of the sun, which observations, except those of the pole star, are attended, either by a loss of time in watching the object to come into the desired position, or by a lack of precision in the results derived from them, due to imperfect methods and formulæ.

JOHN MAURICE,
Civil Engineer and Nautical Expert.

Chicago, April, 1900.

EASTERN FREIGHTS.

Messrs. Funch, Edye & Co., New York, quote the Eastern freight situation as follows:

Since our last report the demand from Europe for our grain has been less active, which fact, combined with freer offerings of tonnage, has produced a decline in grain freights for Cork f. o., which cannot now be quoted at over 3s. 9d. from Range, whilst rates for picked ports have undergone no change. Charters for general cargo from the Gulf ports for May and early June have declined from 1s. to 1s. 6d. under April rates, but timber charterers have latterly taken a number of boats, meeting the full terms demanded by owners in every recent fixture. The demand for steamers to carry oil to the far East has been met in part only, although a few more fixtures will probably result in a decline in the rates at present obtainable.

The continued scarcity of sail vessel tonnage prevents a more lively business and forces shippers to resort to steam, as manifested by the charter of two steamers for case oil for Java at 32c. Rates for sailers for the far East are slowly advancing, and 26¼ to 26½ cents has been paid for cases to Japan. The same cause tends to stiffen rates in other directions, in proof of which we quote charter of a couple of vessels, one of them now in our port, from the Gulf to Buenos Ayres, at $13.50. Lumber freights from Eastern ports to South America are very firm, but without change in rates, whilst naval store freights continue steady with transactions light. There is a fair demand for general cargo in all directions, but, with a small supply of ships, business has been restricted.

CAPT. JOHN CODMAN, the famous advocate of free ships and free trade, died at Boston on April 6th in his eighty-sixth year. Capt. Codman was born in Dorchester, Mass., on Oct. 16, 1814, and was the son of the Rev. John Codman of that town. He entered Amherst College, but left in his junior year, 1833, finishing his education at sea. In 1847 he married Ann Gertrude, daughter of Anthony Dey of New York City. He became a captain in the merchant marine, and traveled extensively. He was known as an advocate of free ships and free trade, and wrote for many periodicals. Among his publications are "Sailors' Life and Sailors' Yarns" "Ten Months in Brazil, with Notes on the Paraguayan War," "Review of the Report of the Special Committee on Navigation Interests," "The Mormon Country; a Summer with the Latter-Day Saints," "Free Ships; Restoration of the American Carrying Trade," "Round Trip, by Way of Panama, Through California, Oregan, Nevada, Utah, Idaho and Colorado," "A Solution of the Mormon Problem," "Winter Sketches from the Saddle by a Septuagenarian" and "A Biographical Sketch of William Wheelwright, of Newburyport, Mass." Mr. Codman's mind remained clear to the last. He recently wrote an article in favor of free ships and has always supported that contention.

IT is announced that the Borchgrevink south polar expedition has arrived at Wellington, New Zealand, on the steamer Southern Cross and reported having located the magnetic pole. The Borchgrevink expedition left Hobart, Tasmania, for the Antarctic region on Dec, 19, 1898. During the latter part of February, 1899, the members landed from the Southern Cross near Cape Adair, Victoria Land, it having been arranged that the steamer should leave them there with full equipment of every kind and should return for them early in 1900. Mr. Borchgrevink's party consisted of nine, including himself. Lieut. W. Colbeck, R. N. R., was selected as first magnetic observer, to be to assisted by Mr. Louis Bernacchi; Mr. Hanson and Mr. Hugh Evans were chosen as zoologists, and Mr. Kloevstad as medical officer.

ICE REPORT OF THE LAKES.

U. S. WEATHER BUREAU.

LAKE MARINE SERVICE,
DETROIT, MICH., April 17, 1900.

SUMMARY OF ICE CONDITIONS.

Over western Superior the ice has disappeared except the belt two miles wide at Duluth on Minnesota Point and in Chequamegon Bay; over the eastern portion there are large fields of ice which are softening and boats will have little difficulty in forcing passage after the 20th. The ice in St. Mary's river is disappearing and boats can now force a passage; the Poe lock is ready, the ice in Whitefish bay is honeycombing and will break in a few days. In Green Bay the ice has decreased in amount during the last few days. At the Straits the ice is honeycombing and this morning the report indicates that the rain and soft weather will cut the ice badly. There appears to be no ice over northern Lake Huron, but over the extreme southern portion the ice-fields are large but broken up and passing rapidly into the St. Clair river. The ice in Lake Erie is confined to the eastern end, and extends from shore to shore, but will probably become broken up under the influence of high easterly winds. Navigation will probably open about the 21st on all the lower lakes. The P. P. Pratt passed Detroit Sunday night bound up and the State of Michigan passed into Lake Huron this morning bound for Lake Michigan. The display of wind signals will probably be resumed on the 21st instant on all the lakes except Superior, and on Superior on the opening of locks at Sault Ste. Marie. The following special reports and telegrams have been received:

LAKE SUPERIOR.

Duluth, 17—The pack ice against Minnesota Point, remains firm and averages 12 feet thick and extends lakeward two miles, delaying initial out-bound passage of steamer Bon Voyage; harbor navigation open.

Washburn, 13—Northeast wind of past week holds ice in the bay; it is all broken up and will move out with first south or west wind.

Ashland, 14—Cold weather of past week has held ice about stationary.

Eagle Harbor, 13—No ice to be seen in the lake except along shore; harbor ice is softening rapidly.

Houghton, 15—Harbor ice broken, but remains quite solid at either entrance.

Pequaming, 15—Ice still solid but not considered safe; strong south wind will break it up.

Marquette, 17—Ice honeycombed and soft; will move out with high south winds; some water visible off Stanard Rock.

Grand Marais, Mich., 14—Field ice in the lake moving with wind; harbor ice soft.

Whitefish Point, 16—Ice in Whitefish bay has not moved; the ice is badly honeycombed; boats can pass through in a few days.

Sault Ste. Marie, 17—Weather continues favorable; some ice reported around Point Iroquois which cannot last with present weather; boats can get through with little trouble. Poe lock ready.

LAKE MICHIGAN.

Gladstone, 13—Only 5 inches solid ice, the remainder being slush ice.

Escanaba, 17—Rapid disintegration of ice since Sunday; large moving fields will break up with first heavy wind; much open water.

Green Bay—Ice is broken and piled up in the bay about 10 miles north of city; strong wind will open the bay; boats ready to leave.

Sturgeon Bay, 13—Bay south of bridge is all clear of ice; north of bridge is quite firm and about 10 inches thick; has not wasted much during past week.

LAKE HURON.

Port Huron, 17—Ice bridge passing down the river, is thin and running rapidly; small space at foot of lake open with large fields in sight extending as far as can be seen from life-saving station 5 miles above city. Steamer State of Michigan passed into Lake Huron this morning bound for Lake Michigan.

LAKE ERIE.

Lorain—No ice in sight.

Cleveland, 17—No ice since the 12th when large field drifted in view to the northeast. Steamer P. P. Pratt left for upper lakes on the 14th. The Cleveland & Buffalo Line announce running first boat on the 21st.

Ashtabula, 14—Large floating fields of ice in the distance; southerly winds driving ice down the lake.

Erie—No ice in harbor; northerly wind of past week has moved the ice on to the south shore from Canada, and the conditions are less favorable for opening of navigation.

Buffalo, 17—Ice driven up the lake by east winds of past two days, broken up considerably for about 4 miles west of outer breakwater, but appears quite solid west of that and extending from shore to shore. Navigation will open about the 28th instant.

LAKE ONTARIO.

Very little ice is reported in Ontario and is confined to enclosed bays. The St. Lawrence river is filled with running ice.

NORMAN B. CONGER,
Inspector and Marine Agent.

The ice report, with this issue, will be discontinued for the season, as it is anticipated that general navigation will be resumed and the Straits opened by the 23rd.

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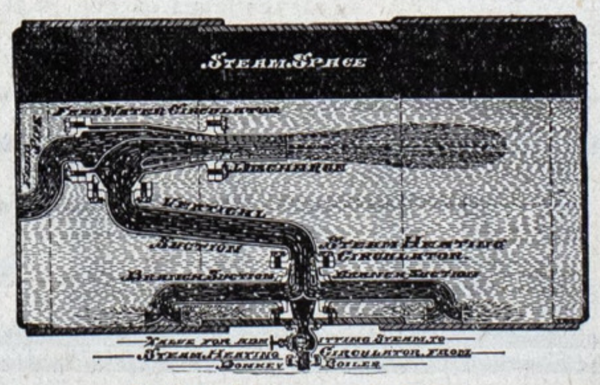

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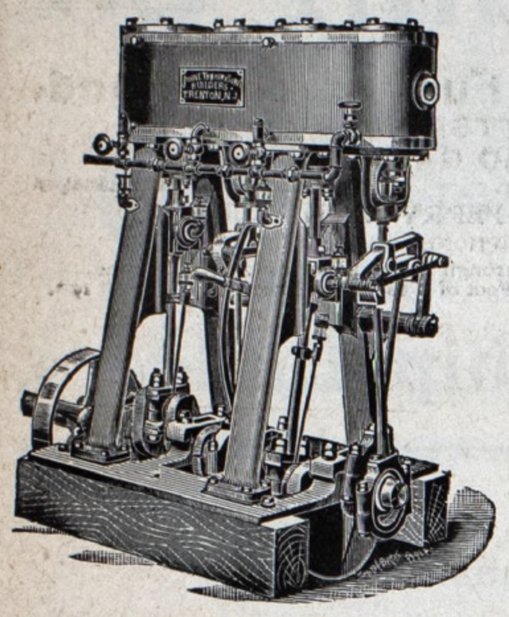

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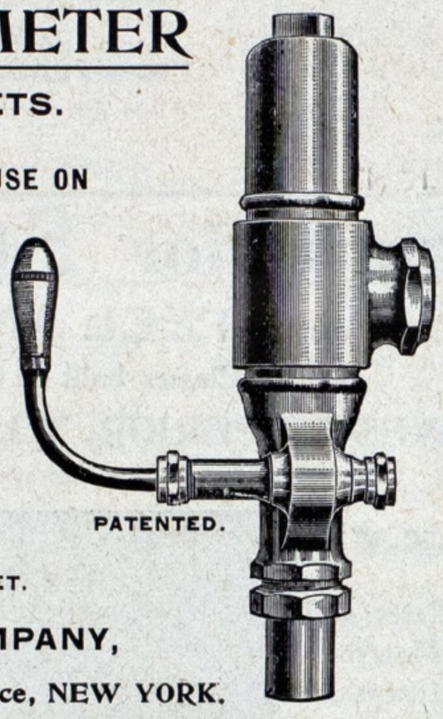

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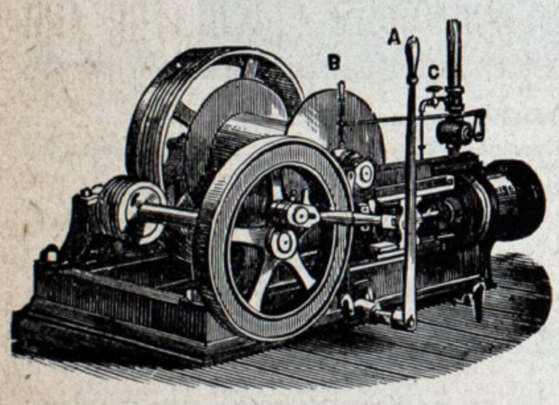

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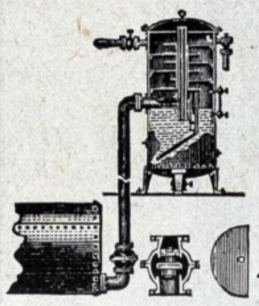

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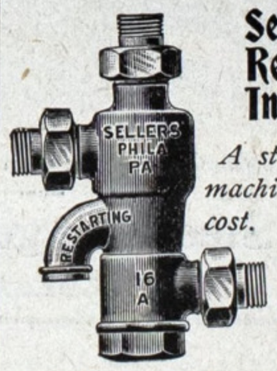

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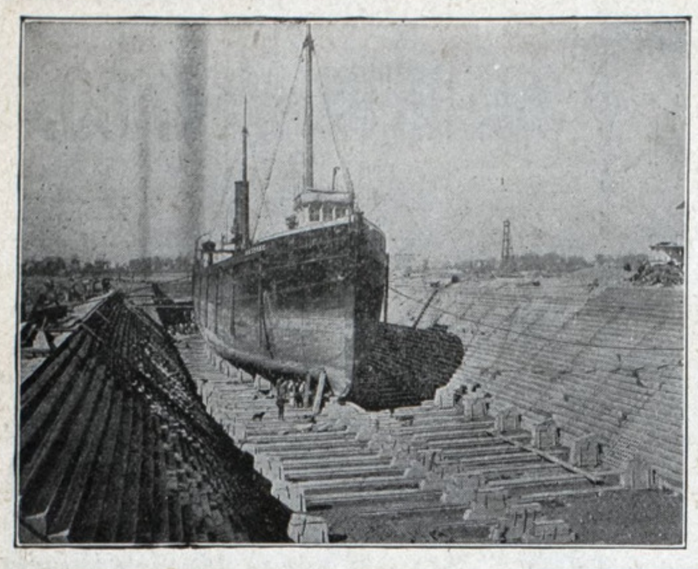

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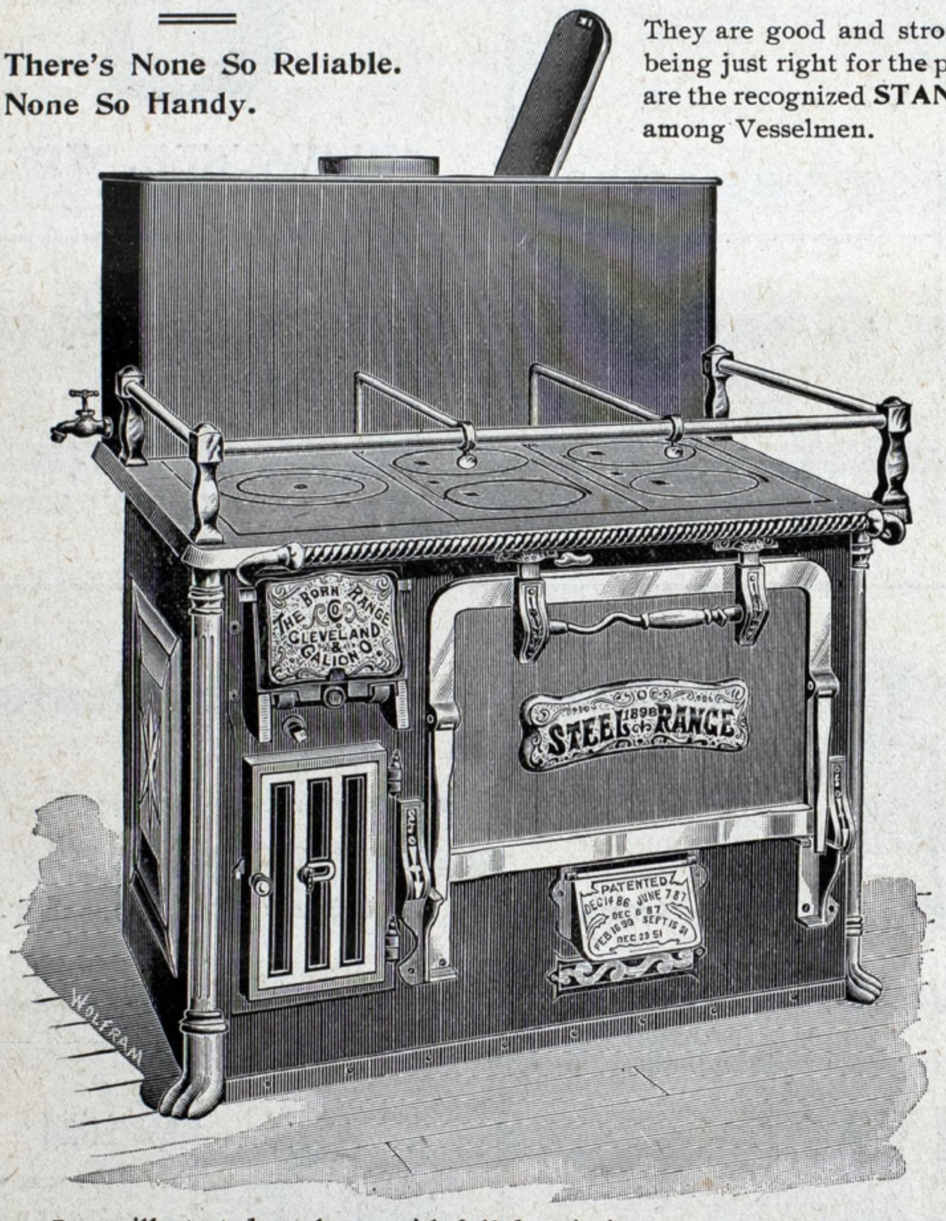

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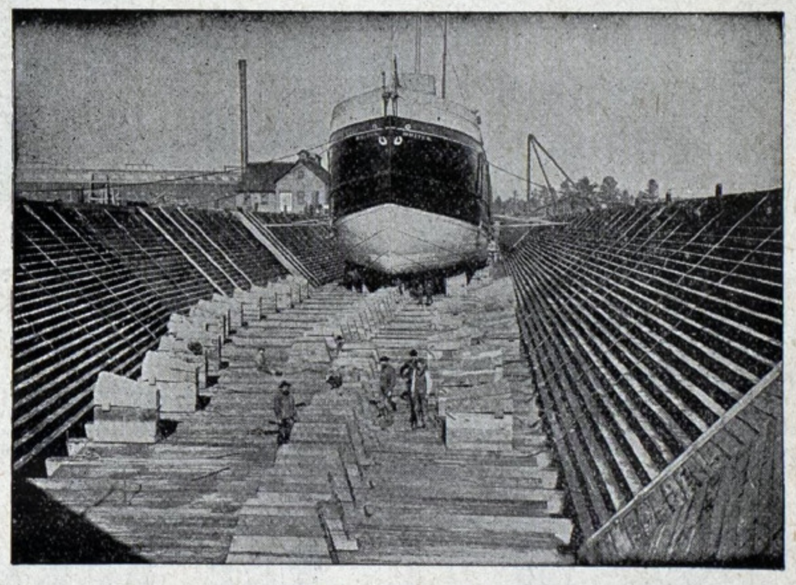

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